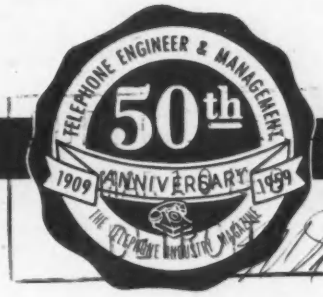
TECHNOLOGY DEPARTMENT

MARCH 1, 1959
Price 50c

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine



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the telephone industry magazine

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Modern Telephones . . . designed for

TYPE 86 KEY TELEPHONE

Saves time and steps around the office!

Key telephone service gives your subscriber access to all office lines—*at one desk!* No more racing around the office to answer phones. Instead, he lifts the handset of his key telephone, presses a button and the call is connected. He holds outside lines while using another line, too. Your subscriber saves time and steps—gets more work done!

The Type 86 Key Telephone gives your subscriber a complete communications package. It's used with the Automatic Electric 10-A1 Key System—or W.E. 1A and 1A1 Systems.

Type 86 Telephones accent any office decor. They're available in 10 attractive colors. Use Type 86 Telephones to boost your revenue. Write for full ordering information.

AUTOMATIC ELECTRIC

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Provides two-line pickup and extension exclusion!

Three different models of the Type 85 Telephone fill a special need for many subscribers in your area. Doctors, attorneys, insurance offices, real estate agencies and many others are all potential customers. They'll want the convenience, efficiency and privacy that these telephones provide.

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Type 85-B gives your subscriber extension exclusion. It is equipped with two buttons. To cut off all extensions, the user presses the exclusion button. To bring in an extension party, he simply presses the other button.

Type 85-C combines two-line pickup, signaling and extension exclusion.

For more information on Type 85 Telephones write for Circular 1909.

AUTOMATIC ELECTRIC

office convenience by Automatic Electric

TYPE 88-T SPEAKERPHONE

World's most compact loud-speaking phone!

Automatic's new Type 88-T Speakerphone is the most compact loud-speaking phone you can buy. That's because it's transistorized! There is no control cabinet. It's the *same size and shape* as our famous Type 80—no extra bulk.

With the Type 88-T, no special power supply is required. You install it like a regular phone... without time-consuming delays.

Speakerphone gives your business subscribers *no hands* telephoning. It's ideal for conferences. Install it in the home, too. The lady of the house appreciates its convenience when she has her hands full.

You can get Speakerphone in a choice of 10 eye-catching colors. For the full story on the Speakerphone, write for Circular 1857-C.

AUTOMATIC ELECTRIC

TYPE 83 COMPACT TELEPHONE

Mounts on Any Vertical Surface!

Automatic's Type 83 Compact Telephone mounts on *any* vertical surface—wall, column, side of desk, etc. Saves valuable working space on desk and table tops. Requires only 7" x 3¼" for mounting.

Type 83 Telephones give your subscribers famous Type 80 transmission. And, you don't have to worry about stocking special parts—this phone uses standard components! There's a choice of 10 beautiful colors, too: Gardenia White, Camellia Pink, Forget-Me-Not Blue, Sand Beige, Garnet Red, Jade Green, Classic Ivory, Dawn Grey, Sunlight Yellow and Turquoise.

For complete information on all AE telephones, ask for Circular 4055-H. Write: *Automatic Electric Sales Corporation, Northlake, Illinois. In Canada, Automatic Electric Sales (Canada) Ltd., Toronto 16.*

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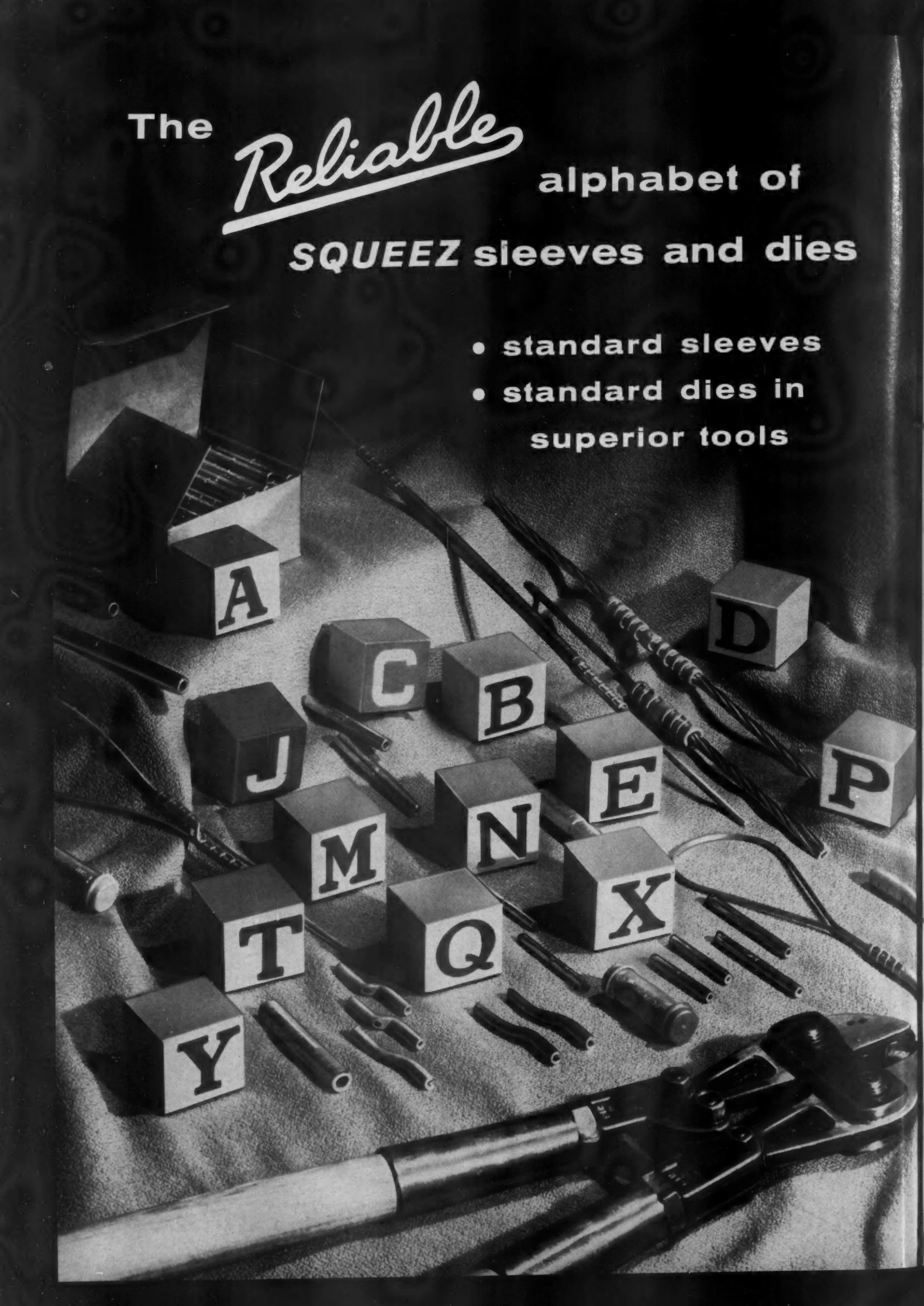
Subsidiary of GENERAL TELEPHONE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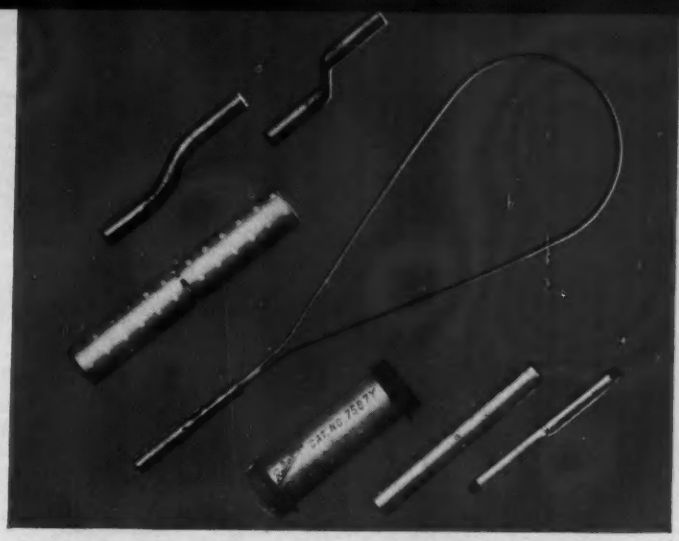
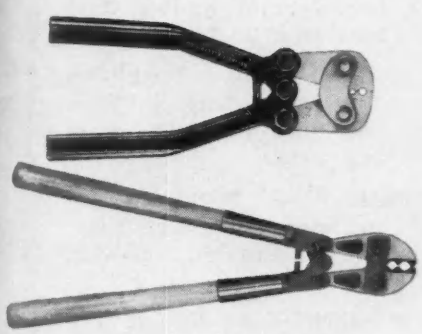


For splicing, tapping, reducing, repairing, transposing and deadending communications and powerline conductors.

over 350 catalog numbers for standard use

SQUEEZ Sleeves have been in continuous production at Reliable for over a quarter of a century, and are manufactured to close tolerances meeting rigid requirements. For easy identification, you'll find Reliable *SQUEEZ* Sleeves clearly marked for wire type, size and die groove.

SQUEEZ Sleeves are for use with aluminum, ACSR, solid and stranded copper, copper covered steel and galvanized steel.



Two of several fine quality compression tools listed by Reliable with various standard dies.

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Reliable *SQUEEZ* Tools, with the dies that have become standard, produce highest die pressures by toggle action requiring minimum effort. They are factory set to standard specifications. Method of adjustment, to compensate for inevitable wear, does not invite field tinkering. If desired, minor adjustments can be made by selected personnel using instructions available from Reliable.

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Factory service for your *SQUEEZ* Tools

Reliable offers a factory repair service for *SQUEEZ* Tools. Minimum charge is $2.00 per tool for inspection and adjustment. Parts and labor at nominal additional cost.

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A SYMBOL OF INTEGRITY SINCE 1909

Crapo HTL-135

HIGH STRENGTH + HIGH FATIGUE ENDURANCE = SAFER LONG-SPAN RURAL LINES

High strength alone is not enough to insure dependable performance in a telephone line wire. The wire also must have high fatigue endurance to provide the margin of safety so necessary in long-span construction. *Crapo* HTL-135 Telephone Line Wire combines high tensile strength and high fatigue endurance with excellent transmission quality to make it the most reliable and economical conductor available for rural subscriber lines. Time and time again, this rugged wire has proved its ability to withstand heavy ice and wind loads, severe temperature changes, vibration and shock damage. The reason is that *Crapo* HTL-135 is tailored to do the job for which it is intended and to do it at the lowest cost commensurate with sound engineering practice.

For dependable long-span, low-cost rural lines, specify *Crapo* HTL-135, the wire with the built-in safety factor. Write for Manual N-53 containing complete engineering data!

coming

CONVENTIONS

NORTH DAKOTA Telephone Association, March 16-17, 1959.

IOWA Telephone Association, Hotel Fort Des Moines, Des Moines, April 7-8, 1959.

OHIO Telephone Association, Deshler Hilton Hotel, Columbus, April 13-15, 1959.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, April 20-21, 1959.

NEBRASKA Telephone Association, Hotel Cornhusker, Lincoln, Apr. 21-22, 1959.

INDIANA Telephone Association, Claypool Hotel, Indianapolis, Ind., May 6-7, 1959.

WISCONSIN Telephone Association, Plankington House, Milwaukee, May 13-14, 1959.

KANSAS - MISSOURI Telephone Associations, Continental Hotel, Kansas City, Mo., May 25-26, 1959.

PENNSYLVANIA Telephone Association, Buck Hill Falls Inn, Buck Hill Falls, June 1-3, 1959.

CALIFORNIA Telephone Association, Ambassador Hotel, Los Angeles, June 3-5, 1959.

WASHINGTON-OREGON Telephone Associations, Olympic Hotel, Seattle, Washington, June 11-12-13, 1959.

NEW YORK Telephone Association, Scaroon Manor, Schroon Lake, June 15-17, 1959.

TENNESSEE Telephone Association, Hermitage Hotel, Nashville, Tennessee, Sept. 9-10, 1959.

ARKANSAS Telephone Association, Arlington Hotel, Hot Springs, Ark., Sept. 14-15, 1959.

MICHIGAN Telephone Association, Pantlind Hotel, Grand Rapids, Mich., September 15, 16, 17, 1959.

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to increased revenue and profits...

* **Complete Toll Accounting.** See the 5th ad in this series for a special "Name-the-System" contest. Win a hat of your choice!

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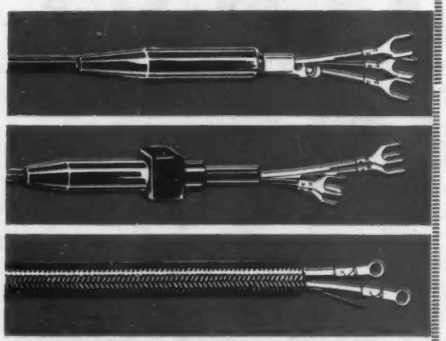
QUALITY
LONG SERVICE LIFE

ALWAYS
BUY
COMMERCIAL

It's as simple as that! . . . and Commercial installations are proving this point to hundreds of users year after year. So whenever you order cords—remember, A-B-C and be satisfied!

You name 'em...we make 'em!



- Straight Neoprene-Jacketed Instrument Cords with twisted or parallel inners.
- Spiraflex® Retractile Cords
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All Commercial Instrument Cords Now Available in Color

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COMMERCIAL CORD COMPANY, INC.
CLIFTON SPRINGS, N. Y.
Phone: HOward 2-2311

QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

"TL For Counts"

TO THE EDITOR: — "Each issue of "*Telephone Engineer & Management*" usually carries at least one cartoon by *Jim Counts*. To my way of thinking each one is superb and depicts many of our day-to-day experiences. For example: The December 15th issue — page 104 — "Just a dummy, but you'd be surprised how well it works." I could use some of these in my monthly bulletins to emphasize the point — for instance — in this case limiting telephone calls to 3 minutes.

"Are mats or cuts available, or is it possible to get permission to retrace or copy them for multigraph or mimeograph use? I should think that with all of us striving to improve service and merchandise our product there would be a market for tracings, mats, or cuts. . ."

L. L. Anderson, Mgr.
Northeast Missouri Rural Tel. Co.,
Green City, Mo.

If other readers like the idea and let us know they can make use of the cartoons we will get in a huddle with cartoonist Jim Counts and work out something. — The Editors.

"Plant Man's Handbook"

TO THE EDITOR: — I believe that your idea of publishing a new "Plant Man's Handbook" containing several of Mr. Reed's articles is an excellent idea. If and when you do this, please let me know. Also hope you make this book pocket size so it can be carried in field.

William H. Quatman, Jr.,
C & P Tel. Co. of Va., Plant Dept.,
Norton, Virginia.

TO THE EDITOR: — According to your note in *Telephone Engineer & Management* magazine you are considering the publication of a "Plant Man's Handbook" containing articles from your magazine. We are interested in such a publication and hope you can go forward with your plans for it. Mr. Reed's articles, as well as many others you have published, are very practical and valuable to the small and medium size telephone companies.

Wm. H. Klingler, Jr.,
General Manager,
Citizens Tel. Co. of Clay County, Inc.
Brazil, Ind.

TO THE EDITOR: — I'll buy one of the proposed "Plant Man's Handbook" (Page 54 of Dec. 1, 1958 TE&M).

Cecil McBrayer,
318 *Donaldson,*
San Antonio, Texas

TO THE EDITOR: — "Please find request for information regarding Handbook data sheets for Outside Plant Construction, Installation & Maintenance Practices. Having followed John S. Reed's articles in *Telephone Engineer & Management* Magazine, I feel that if we had this handbook data for each of our employes it would enable each man to know and perform his work more efficiently. . . ."

G. Lester White,
(Installation Foreman)
R.D. #1, Ephrate, Penna.

The above letters are typical of the many received after we announced possible publication of a new "Plant Man's Handbook" containing many of John S. Reed's articles on plant subjects. If you want us to go ahead with the book drop us a line. The book will be 100 *or* 120 *pages and will sell for* $1. *It will contain most of Mr. Reed's articles on cable construction and station installation.*

"We Goofed"

TO THE EDITORS: — "There is an erroneous report in the December 15 issue of your magazine. On page

XY® TOLL TICKETING*...

will make money for you...

The Stromberg-Carlson Toll Ticketing System is created to put more profit in your operation; yet is simple and economical in design.

Fully automated, its magnetic tape storage principle permits playback information to feed into typewriter, card-punching machine or punched tape.

Get the extra revenue of DDD now . . .
with money-making XY Toll Ticketing.

Printed circuit board is from XY Toll Ticketing accounting chain.

* **Complete Toll Accounting.** See the 5th ad in this series for a special "Name-the-System" contest. Win a hat of your choice!

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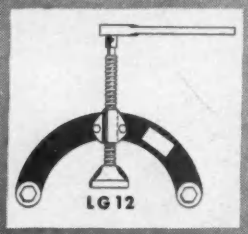
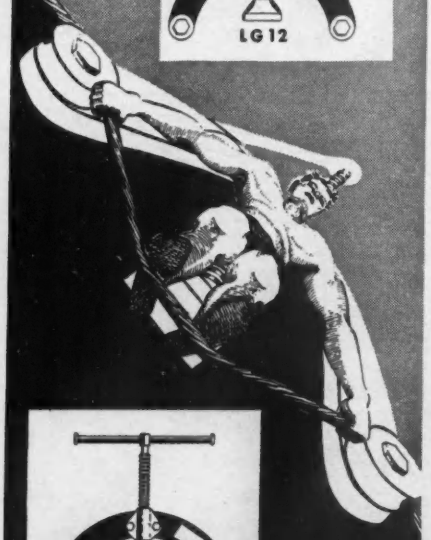
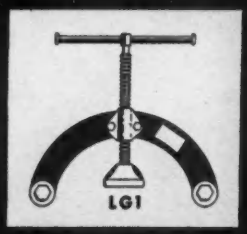
LITTLE
Giant
SLACK PULLER

For pulling slack in a messenger you need a man with the strength of Hercules, the ruggedness of Atlas, the speed of Mercury . . . or a Little Giant Slack Puller.







If you need to pull slack in a messenger for any reason, either of the Little Giant Slack Pullers, the LG1 slip handle or the LG12 ratchet handle will do the job Quick, Easy and Safe.

WRITE OR PHONE

SERVING THE GROWING INDEPENDENT TELEPHONE INDUSTRY
CABLE SPINNING EQUIPMENT CO.

3100 TOPEKA AVE.
TOPEKA, KANSAS

63 under TELEPHONE PROPERTY TRANSFERS, it is listed that General Telephone Company of Upstate New York, Johnstown, N. Y. Purchased New Wilmington Telephone Company, New Wilmington, N. Y. This should read PURCHASER — General Telephone Corp., New York, N. Y.; SELLER — New Wilmington Telephone Co., New Wilmington, Penna.

George P. Norton,
Public Relations Director,
General Telephone Corp.,
New York 16, *N. Y.*

"Readers Like Them, Too"

TO THE EDITORS: — "I have noticed several articles on clay conduit for underground telephone cables in recent issues of TELEPHONE ENGINEER & MANAGEMENT. Since we have manufactured clay conduit for more than 40 years these articles have been very interesting to us and I know valuable information to the telephone people."

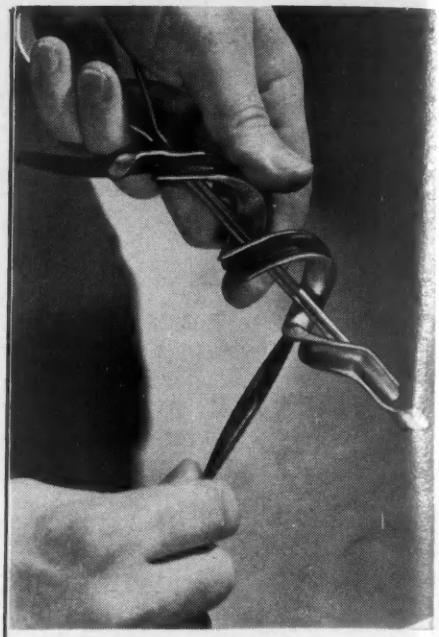
W. M. Price,
Brazil Hollow Brick & Tile Co., Inc.,
Brazil, Indiana.

"Skip-Stop Plan"

TO THE EDITORS: — "We read with great interest your (Mr. Stacey's) article in the January 15, issue of TELEPHONE ENGINEER & MANAGEMENT concerning the skip-stop plan for paystation collection. We are in the process of analyzing our own operations in regards to our paystation collection procedure, and this naturally has given us quite a bit of food for thought. If you have any additional information concerning this plan or the methods of putting it into effect, we should sincerely appreciate your sending such information to us. We look forward each month to your articles."

R. L. Toney,
General Telephone Co. of Florida,
Tampa 1, *Fla.*

SOMETHING ON YOUR MIND? . . . Write it down, and send your letter to "The Open Forum," care of TE&M, 7720 Sheridan, Chicago 26, Ill.



Wire-Saving Snubbing Action . . . with this

KEARNEY

SNUB-R-GRIP DROP WIRE GRIP

On poles or buildings this free-swinging drop wire tie provides a "snubbing" action stronger than the rated strength of the wire. This is possible because the unique spiral grip distributes the pull over a long length of wire. KEARNEY Snub-R-Grips are quickly installed and easily salvaged. Just wrap the wire (twisted pair, parallel or synthetic-jacketed) into the grooved spiral. A portion of the groove's inner surface is specially coated to give maximum non-slip grip . . . without damage to insulation.

For Better Construction . . . Safer Maintenance

Specify 268

KEARNEY PRODUCTS

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Canadian Plant: Guelph, Ontario

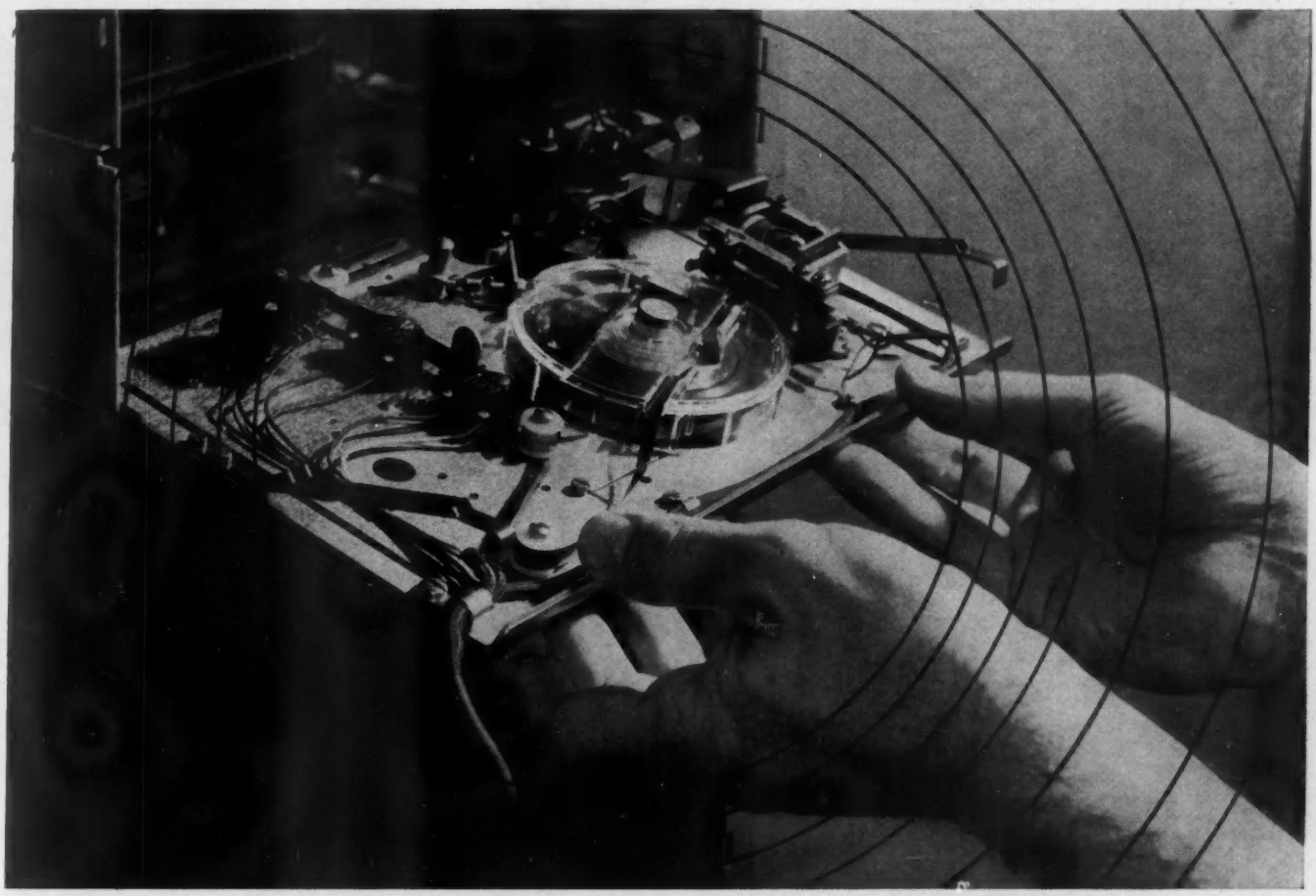
XY® TOLL TICKETING*...

completely compatible, fully flexible...

With Stromberg-Carlson Toll Ticketing in your exchange, your subscribers can dial directly into the nationwide system. Magnetic tape recorders store and release information **without personal attention, transport** or **reloading.**

Get the extra revenue of DDD now–with XY Toll Ticketing.

Magnetic tape recorders in XY Toll Ticketing System are easy to jack in-and-out.



* **Complete Toll Accounting.** See the 5th ad in this series for a special "Name-the-System" contest. Win a hat of your choice!

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POLE PRUNERS

No. 11
Cuts up to 1" branches. A strong, durable, easy cutting 18 foot tree pruning unit. Spruce extension poles in 6 foot sections, with telescoping aluminum joints.

No. 12
Cuts up to 1½" branches. Pruner head is malleable iron casting, husky, unbreakable. Smooth, easy cutting action.

LOPPING SHEARS

Heavy duty, fast easy cutting loppers designed for utility use.

No. 75
Compound lever cutting action, smoothly slices through 1¾" to 2" branches.

Nos. 525, 530
The famous "Tiffany" pattern lopping shears 25" and 30" models. Cut branches up to 1¾".

PRUNING SAWS

No. 1826
26" blade of Sandvik Swedish steel especially designed for true work. For those spots where a chain saw can't operate.

Send for literature and additional information on pruning tools of all types.

Quality Tools
SEYMOUR SMITH
Since 1850

SEYMOUR SMITH & SON, INC.
Oakville, Connecticut, U. S. A.

Sales Representative
JOHN H. GRAHAM & CO. INC.
105 Duane Street, New York 8, New York

INDUSTRY OBSERVATIONS

by L. A. GRITTEN

"Lower Toll Rates vs. Equity"

OREGON Commissioner's decision on Pacific Bell's rates takes poke at Bell Separations Manual and its acceptance by most regulatory commissions. Similar decisions may compel re-appraisal.

Wanted: Some Untainted Mikoyans

HOWEVER foul his purpose, whatever his morals, Anastas Mikoyan gave us a remarkable demonstration of public relations ability. Dripping with the blood of our friends, an avowed enemy of everything our country stands for, this self-invited guest contrived to make friends by the hundreds and left many Americans in doubt about some of their bitterest resentments. If he were to represent us in rate cases, the regulatory commissions would probably insist on higher rates than we want — and make them retroactive.

* * *

Lower Toll Rates vs Equity

MILLIONS of words have been written about those difficult and related subjects, separation studies, inter- vs intra-state rates, and toll settlements; but as with taxes, caviar and women, nothing definitive has been decided about them.

The Pacific Telephone and Telegraph Company's Oregon rate case evoked some trenchant criticism of general interest. Howard Morgan, the Oregon Commissioner, in an order signed just before he stepped out of office, strongly decries the Bell Separations Manual and its acceptance by most regulatory commissions: ". . . the Manual has found its way into the telephone rate structures of the nation . . . largely by the energetic efforts of the Bell System's spokesmen, and it has remained there largely by default." He cites the glaring disparity between interstate and intrastate toll rates — "so intolerable as to outrage the public" — in Oregon and generally throughout the country. The order reduces Pacific's rate base in Oregon by about $10 million transferred from intrastate to interstate operations; and it awards the company an annual increase of less than 16 per cent of the $4.8 million Pacific Bell requested as essential to its operations.

L. A. GRITTEN'S "Industry Observations" appear exclusively in "Telephone Engineer & Management."

The steady reduction in Long Lines toll rates has been made in disregard of two fundamental needs: adequate toll revenue for the Independents, and reasonable equity between interstate and intrastate toll rates. Similar decisions by other state commissions may compel an "agonizing reappraisal."

* * *

Our Worst Menace

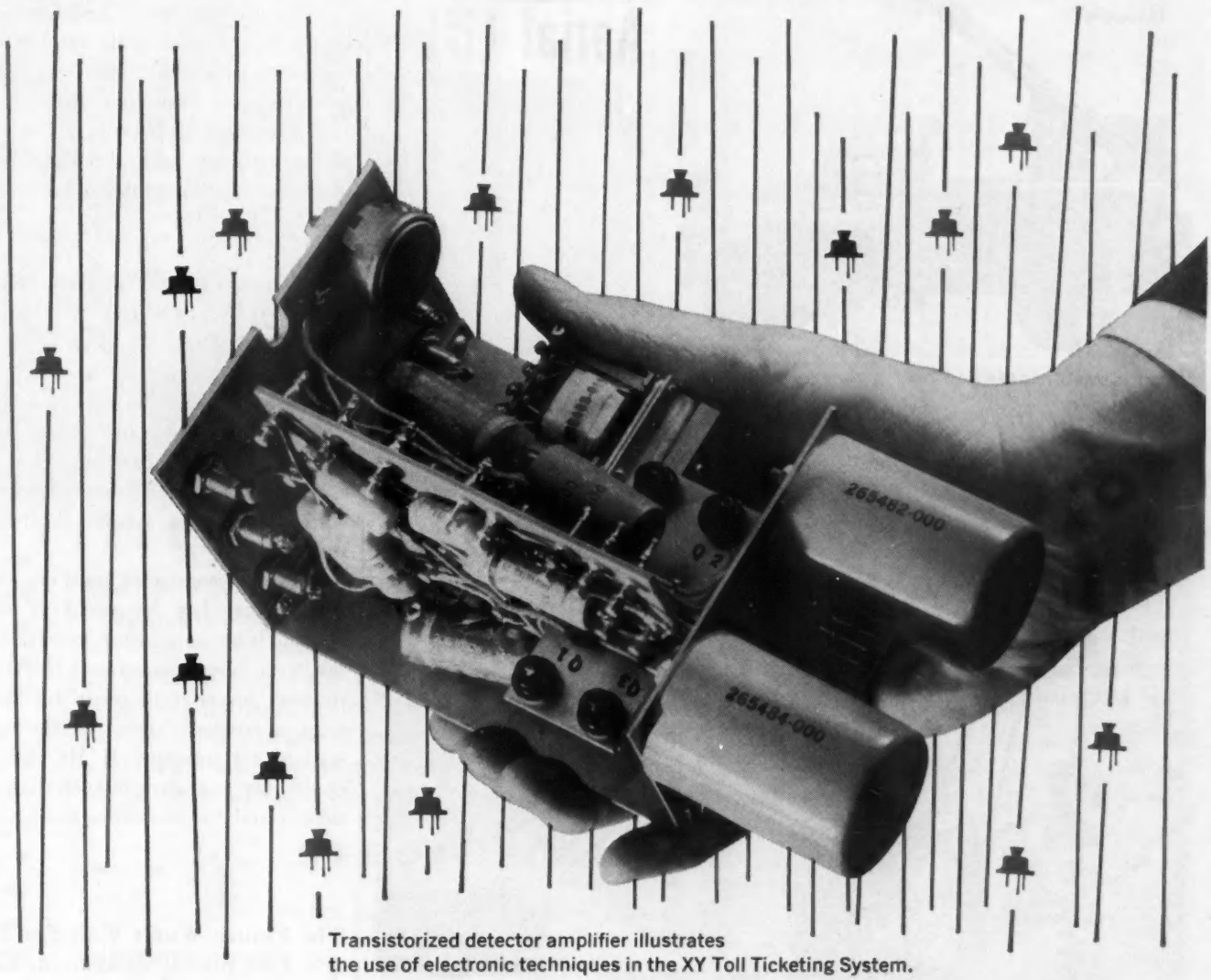
CURRENT or pending negotiations will affect the wages of some quarter of a million telephone employes. Also affected will be 170 million Americans whose worst danger today comes not from I.C.B. missiles or spaceships but from In-

XY® TOLL TICKETING*...

uses modern electronics...

In Stromberg-Carlson Toll Ticketing System, modern electronic principles and techniques are used to the fullest. The result: high speed, high reliability, low maintenance cost. **Get the extra revenue of DDD now–with XY Toll Ticketing.**

Contact your Stromberg-Carlson representative.



Transistorized detector amplifier illustrates the use of electronic techniques in the XY Toll Ticketing System.

* **Complete Toll Accounting.** See the 5th ad in this series for a special "Name-the-System" contest. Win a hat of your choice!

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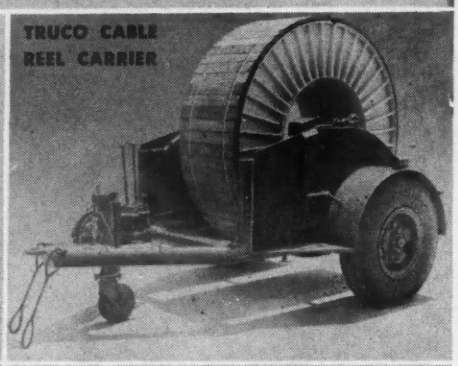
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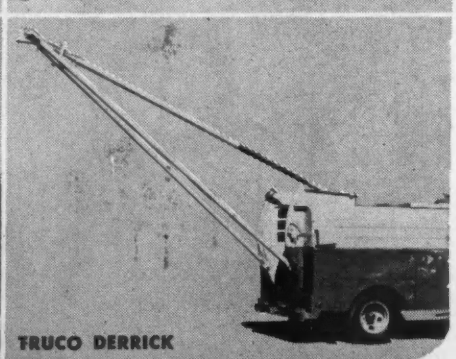
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flation, whose principal cause is the annual wage increase regardless of production.

For much of that we may thank the weak acquiescence of the major employers. The steel industry has set the national pattern of yielding too easily. They are like Donna Julia, the lady in Byron's "Don Juan," who . . . whispering "I will ne'er consent," — consented. Year after year, they have made a token resistance, followed by rises in steel wages that paved the way for the inflation disaster that now threatens us.

It is not a pretty prospect, but there is a ray of hope. Tom Campbell, editor of "Iron Age," predicts for 1959: "The industry (steel) has to meet this one head on, because it is no longer within the realms of reason to have a big steel wage and price increase year after year." . . . Is it too much to hope that the telephone industry will also decide to meet its inflation problem head on?

* * *

The Voice From The Heavens

DAVID K. deNEUF, vice president of Press Wireless, suggests that our space vehicles be equipped with voice transmitters to broadcast at 20 megacycles, in several languages, messages that may be received by almost "anyone, anywhere, equipped with a simple shortwave receiver."

It sounds wonderful, until one considers what has happened to television. Why tune your receiver to the "ever moving spheres of Heaven," to hear an advertisement for laxatives, a crooked "quiz," or the votewail of a candidate? If Mr. deNeuf could only guarantee to keep the politicians and the hucksters away from it!

* * *

The Future Won't Wait For Us

IN THE present dramatic development of communications, the fate of our numerically dwindling Independent telephone companies may depend upon how we use the modern marvels that inventors and manufacturers are dangling before us. If we lack nerve and imagination, if we

XY® TOLL TICKETING...

proven extra revenue producer...

Since installing Stromberg-Carlson Toll Ticketing equipment, the Redmond exchange of Northwest Telephone Company has enjoyed a 28% increase in toll revenue! You, too, can **get the extra revenue of DDD now–** with XY Toll Ticketing. Contact your Stromberg-Carlson representative.

James M. Wells (top), President of Northwest Telephone Company; T. J. Wells, former President and Manager.

New Name Contest—Here's how you can win the hat of your choice, made by any U.S. manufacturer. We need a short, descriptive name for this XY Toll Ticketing System. Perhaps you can suggest one. Simply think of a name for our Toll Ticketing equipment and tell us—in 25 words or less—why you chose it. We offer these suggestions as guides: S-C ELMA—Stromberg-Carlson ELectronic Message Accounting; MAGTAC—MAGnetic Toll ACcounting. We may decide to use one of these, but if your suggestion is judged best, you'll win the hat anyway! All entries must be postmarked no later than midnight, April 30, 1959. Judges' decision will be final. Complete the coupon below and mail it to F. W. Haupt, Advertising Manager.

S-C STROMBERG-CARLSON

STROMBERG-CARLSON

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I suggest the name.....**because**

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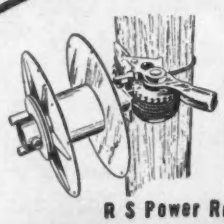
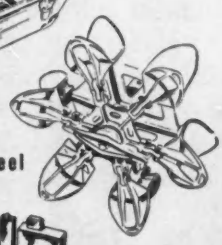
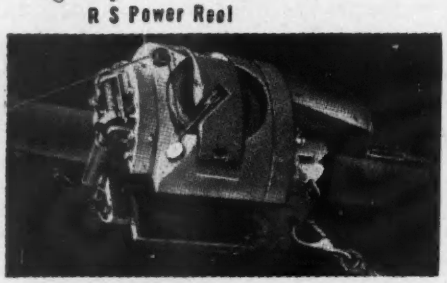
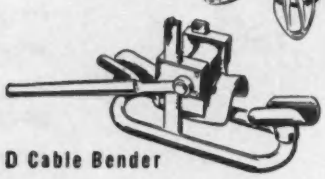


R S Power Reel



C R Power Reel





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* * *

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REFLECTION after Ed Murrow's television show "Small World": This type of presentation could immensely help our public relations. We listened to a discussion between Willy Brandt, Mayor of Berlin, in Berlin; Michael Foote, editor of the *Daily Herald*, in London; and James B. Conant, former US Ambassador to West Germany, in this country. In a few minutes we had lost some prejudices and gained a better idea of what the Berlin affair is all about. It was an interesting and educative experience.

National broadcasts of this type, with our own outstanding VIP's debating the telephonic problems of the day with leading journalists or key men in Congress, could be very valuable. Local TV panels have been tried, but the cost is a deterrent. However, politically inspired regulation will cost us much more, if we fail to educate the voters to distinguish between demagogic balderdash and the plain facts of telephone service. . . .

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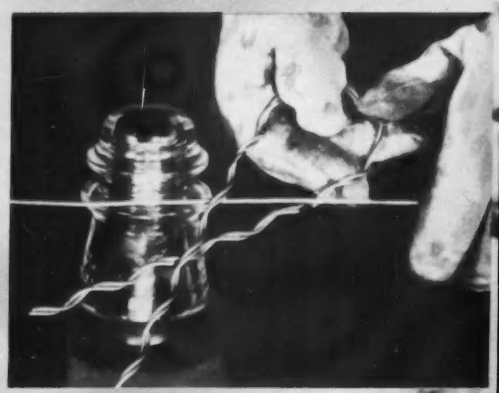

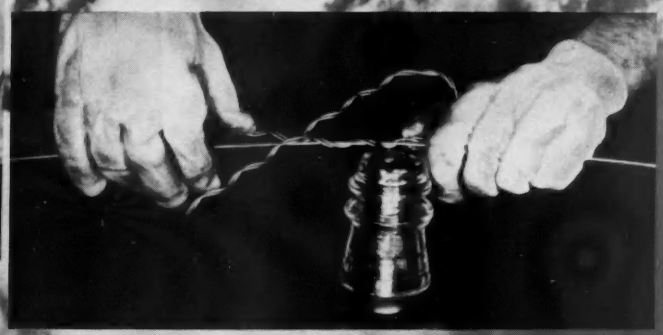

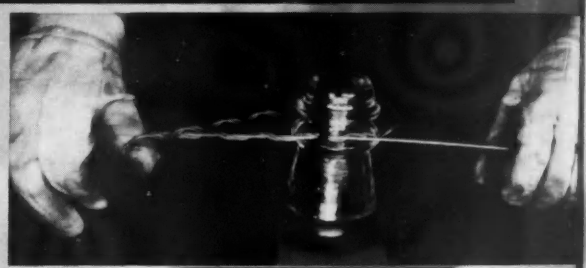

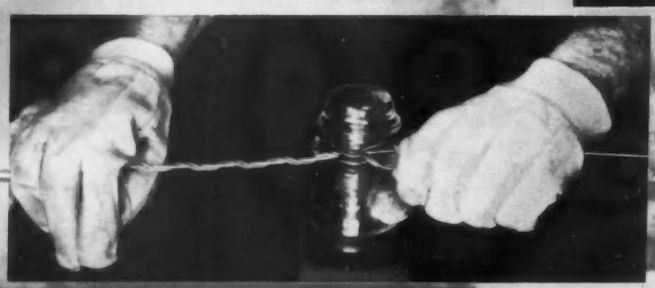

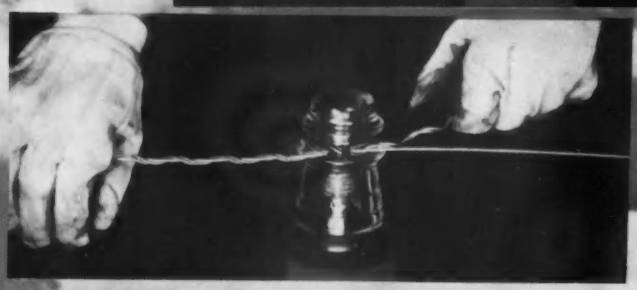

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- descriptive brochure
- application procedure
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Telephone-Engineered from Dashboard to Switchboard—Lenkurt Mobiltel offers for the first time a completely packaged system specifically engineered for telephone company use.

Complete from handset to antenna, and compatible with Bell equipment, Mobiltel opens up broad opportunities for:

1. *Mobile Subscriber Service* in automobiles, trucks, boats and planes.
2. *"Fixed Mobile" Service* to isolated ranches, farms and temporary construction sites in areas not served by wire lines. Utilizes modified Type 80 telephone instruments.
3. *Mobile Telephone Communications* between the telephone company and its maintenance units.
4. *Quick Service* in disaster areas and other emergency setups.

Lenkurt Manual Mobiltel has the flexibility required to meet all service and installation conditions. It can be used fixed or mobile, without alterations. It is equipped to operate from a standard auto battery, 110 volts A.C., or from an optional transistorized power supply. This permits the same units to be used for local or base station installation, either indoors or pole mounted.

Lenkurt Mobiltel is equipped to operate on any standard frequency or power output—either split channel or wide band. Since it is compatible with Bell, Mobiltel is not restricted to any given area of operation.

The complete Mobiltel package can be furnished in standard frequencies and power outputs on an "engineer, furnish and install" basis. For the full story on Lenkurt Manual Mobiltel, write today for descriptive literature, or call your Automatic Electric Representative.

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"AVERAGE REVENUE
JUMPED 85% WITH AN
ALCOA TANDEM BOOTH"
TELEPHONE
TELEPHONE
PUSH

reports F. J. Eherenman of United Telephone Company of Indiana

"Early last year, we replaced an ordinary single booth with a new Alcoa tandem assembly and noticed an immediate increase in revenue," says F. J. Eherenman, General Commercial Supervisor of United Telephone Company of Indiana, Warsaw, Ind.

"We had noticed customers standing in line to use the single booth in front of our business office in Franklin and considered placing another booth along side it. But we decided to install an Alcoa® Aluminum tandem assembly for three big reasons: (1) aluminum's clean, good looks and solid construction blend well with our new, modern exchange building which just opened in January, (2) cost of painting every three or four years is eliminated, and (3) the tandem booth requires less space than two single booths, takes a minimum of sidewalk area.

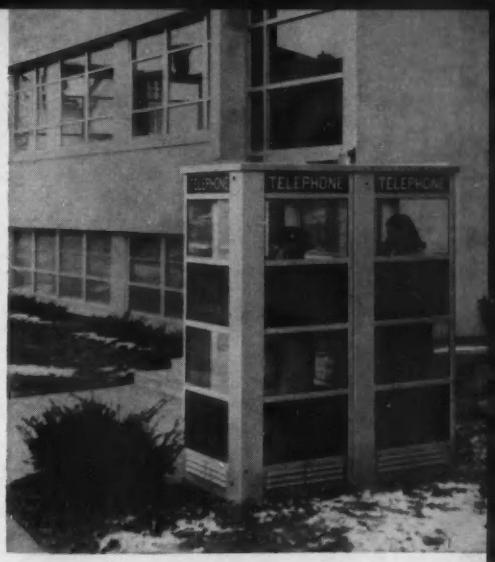
"In the first seven months of service the Alcoa tandem assembly has more than paid its way. Revenue has soared from the previous installation to an average increase of over 85 per cent. It's quite obvious that our customers also like Alcoa booths."

ALCOA GOODWILL KITS

Here's a big extra you get with every Alcoa booth. These FREE kits contain newspaper mats, publicity releases, envelope stuffers, radio and TV commercials—everything you need to tell customers about the added convenience of booths of Alcoa Aluminum.

For more information on Alcoa booths, write for brochure. And ask your jobber how Alcoa booths can increase your revenue and build customer goodwill. Aluminum Company of America, 1721-C Alcoa Building, Pittsburgh 19, Pennsylvania.

F. J. Eherenman, General Commercial Supervisor of United Telephone Company of Indiana, points to the two features of the Alcoa tandem assembly he likes best: the clean, bright appearance that attracts customers and the sleek, compact construction that blends well with the modern architecture of the new Franklin exchange building.



"Notice how neatly the Alcoa tandem booth fits into a minimum of space in front of our new building," says Mr. Eherenman. "Notice, too, how its clean, modern lines make it almost a part of the building because it blends so well with it."

"We erected our Alcoa tandem booth without difficulty," says Supervisor Eherenman. "Easy-to-follow assembly instructions came right with it, and two of our men had the whole job done in a few hours. The Alcoa tandem booth is more compact and has no hard-to-clean gap between the booths. It's strong, too, and both weather- and vandal-resistant."

Old Installation Single Booth	Revenue	New Installation Alcoa Tandem Assembly	Revenue
November, 1957	$ 92.75	March, 1958	$112.60
December, 1957	89.90	April, 1958	125.10
January, 1958	88.10	May, 1958	181.60
February, 1958	103.55	June, 1958	183.00
		July, 1958	174.25
		August, 1958	253.90
		September, 1958	199.30
		October, 1958	155.35

"It's easy to see how monthly revenue jumped immediately after the installation of the modern Alcoa tandem booth," reports Mr. Eherenman.

ALCOA ALUMINUM

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BETTER TO LOOK AT! Choice of 15 attractive colors to match all decors, whether for home, school or business: red, yellow, green, blue, beige, grey, ivory, turquoise, rose pink, aqua blue, light beige, light grey, white, brown, black. Available in standard desk or the new, popular wall models.

BETTER TO LISTEN TO! Surpasses all previous instrument performances! Completely engineered to set a new standard of excellence for independent telephony. Varistors provide proper level of voice transmission; incorporate acoustic peak suppression.

BETTER TO TALK OVER! Speech quality is improved too: the shorter handset design extends the frequency bandwidth, sets a new high in transmitting and receiving performance. The transmitter is closer to user's mouth, gives a better signal-to-noise ratio.

..the Kellogg K-500

BETTER INSIDE! Designed for top performance, using highest quality components throughout. Receiver, transmitter, ringer are new in principle, design and performance; the network is a compact, sealed housing. The single-lobed dial cam provides more uniform pulses; the new number plate makes for faster, surer dialing.

Kellogg's K-500 series is your best answer to assure subscriber satisfaction and long, reliable service. Ask your local Kellogg representative to explain the new monthly shipment plan for K-500s: it guarantees you a steady supply of these wanted telephones —at lowest unit cost.

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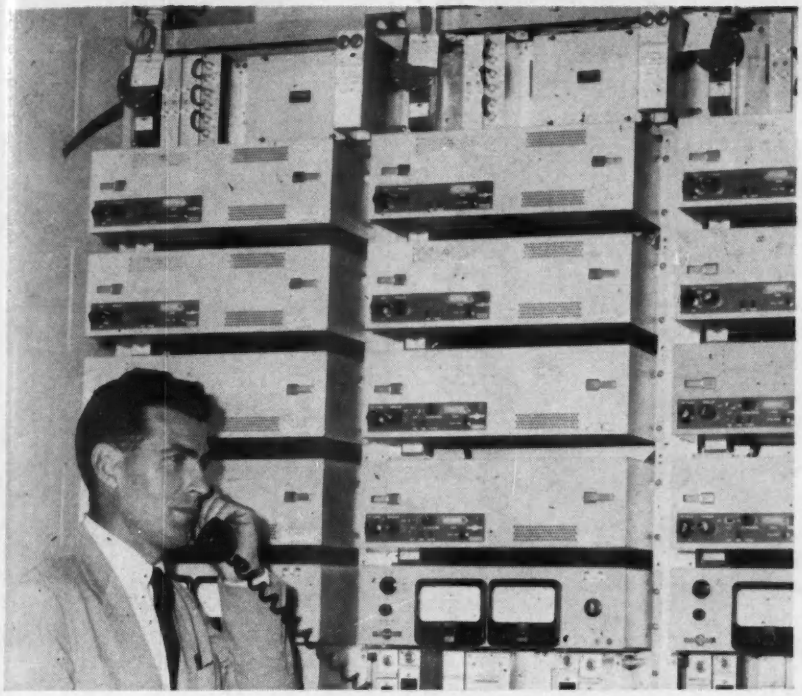
Charles E. Connors, Lincoln Tel & Tel Transmission and Protection Engineer, uses service channel at Brainard station. The service channel gives order wire service between stations of the microwave system on a party line basis.



COLLINS MICROWAVE

doubles Lincoln Tel & Tel toll circuits

In expanding their toll circuits, Lincoln Tel & Tel had a requirement for a reliable communication system for all-weather service. A Collins Microwave System provided the economical answer.

Contributing to Lincoln Tel & Tel's selection of Collins Microwave were such service and maintenance features as complete assembly and pretest of stations in the factory; exceptional frequency stability; built-in metering and test facilities and fixed tuned IF amplifier requiring no field alignment when tubes are changed.

For complete information about Collins Microwave, write or call Texas Division Sales, COLLINS RADIO COMPANY, 1930 Hi-Line Drive, Dallas 7, Texas.

COLLINS

COLLINS RADIO COMPANY
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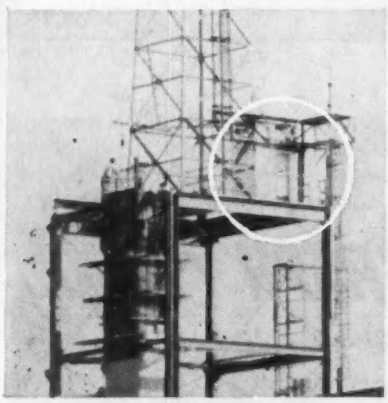
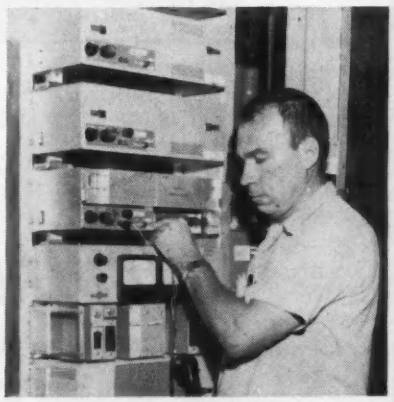
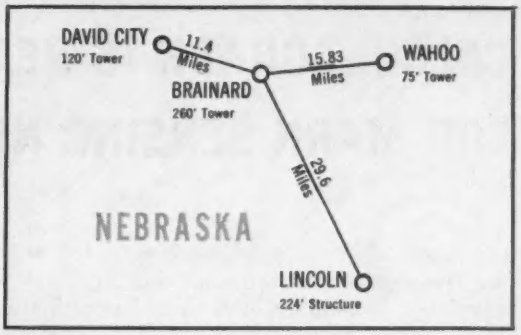


Collins Microwave was installed in the equipment hut (circle) before the completion of the new Lincoln Tel & Tel central office and administration building at Lincoln.

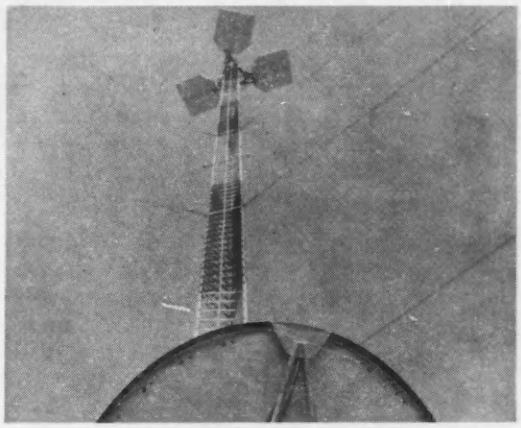


All Collins Microwave equipment is racked and pretested under simulated operating conditions before shipment to the customer. Routine maintenance testing is simplified in Collins equipment.

System map of Lincoln Tel & Tel microwave installation gives tower heights and mileage between stations. The installation of Collins Microwave for Lincoln Tel & Tel paves the way for economical future expansion.

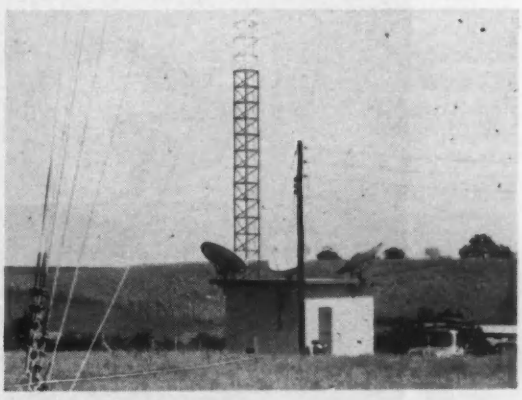


The backside of the Collins parabolic offset feed antenna (foreground) utilized at all stations in the Lincoln Tel & Tel system features a de-icing assembly, which keeps the reflector free of ice during sleet and snow storms.



Paul Henson, Chief Engineer at Lincoln Tel & Tel, recommended expansion with microwave to provide higher quality and more dependable circuits for customers. "Microwave," said Mr. Henson, "has proved to be more economical than expansion by any other type of facility."

The three-way branch microwave repeater station at Brainard utilizes three Collins offset feed antennas for the path to David City, to Wahoo and to Lincoln.

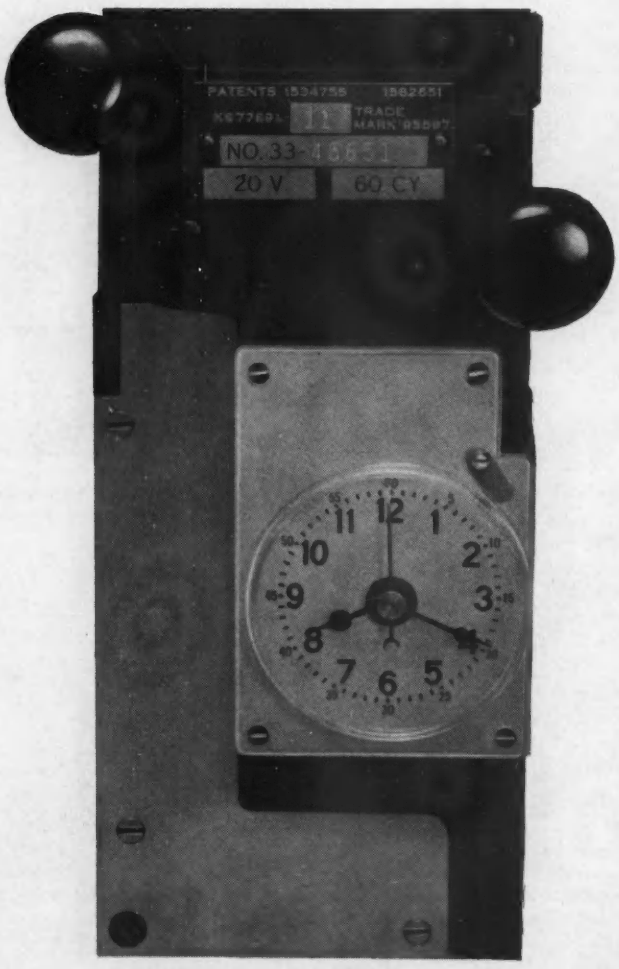


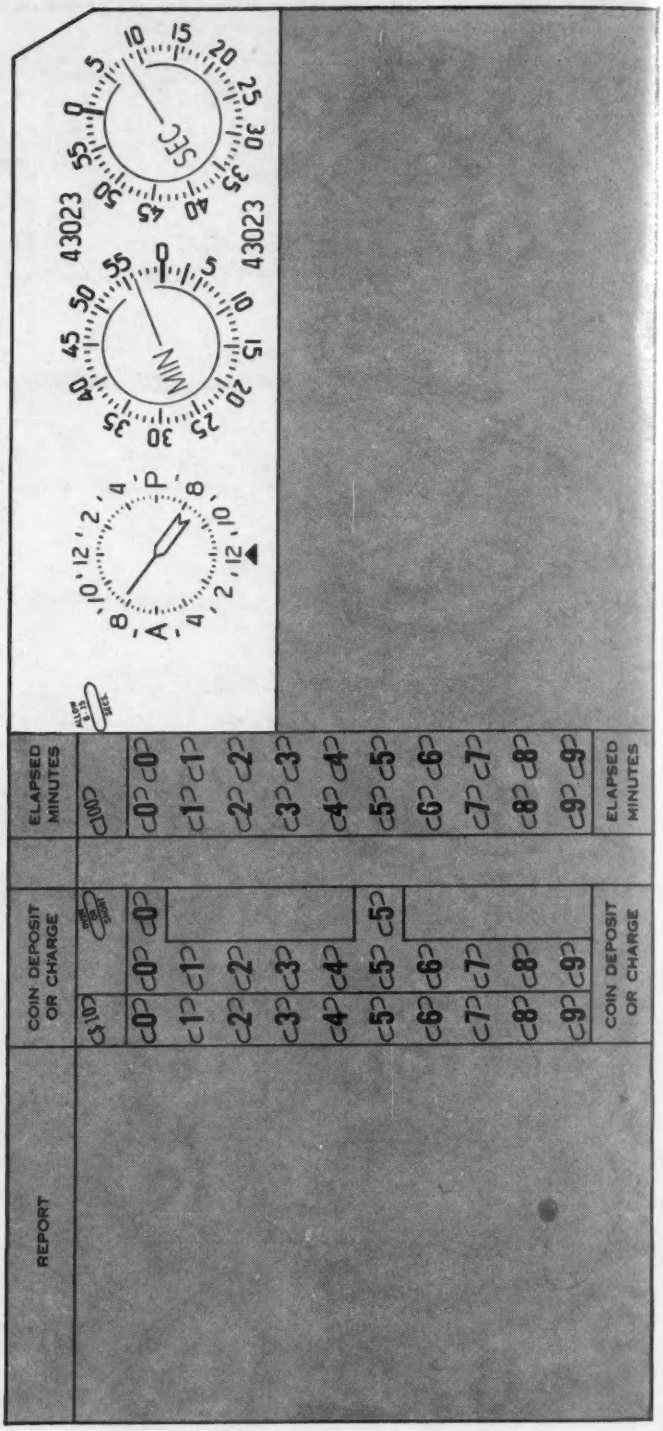
CALCULAGRAPH IS READY FOR MARK SENSING NOW!

If you are planning to use mark sense toll tickets now (or later) be sure your Calculagraphs are readily adaptable. Remember to do these three things now —

1. When ordering new Calculagraphs specify "set back" handles—this feature clears the way for mark sense toll tickets (or ANY SIZE ticket in fact).
2. Plan a program of modification of Calculagraphs now on your switchboard.
3. If you are still using the old round-type Calculagraphs, consider the economics of replacing them with the new space-saving Model 33 that will include all the latest improvements—set back handle, color-coded handles for easier operation and 60-minute dial to assure 100% accuracy on all calls.

If your analysis shows that mark sensing makes sense economically, or your present system requires a larger size ticket, consult your Calculagraph distributor today. Ask him about the set back handle feature as well as other modernization features of the NEW Calculagraph.





CALCULAGRAPH Company

308 Sussex Street · Harrison, New Jersey

Telephone: HUmboldt 2-0213

Manufacturers of Elapsed Time Recorders for over 65 years

Modernizing your telephone system?

CUT INSTALLATION AND MAINTENANCE COSTS WITH LIGHTWEIGHT, FULLY COLOR-CODED ANACONDA ALPETH PLASTIC TELEPHONE CABLE!

Color-coding can cut costs . . . and so can light weight. Anaconda Alpeth offers both.

Anaconda Alpeth's full color-coding assures faster, easier installation, splicing, terminating, and maintenance. Completely eliminates time wasted on field matching and testing individual pairs.

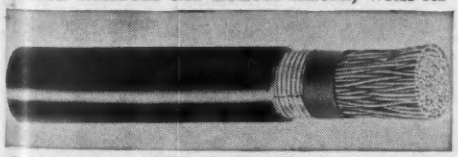
Anaconda Alpeth's light weight means both convenience and important savings. With a multiple sheath made of Aluminum and Polyethylene, Alpeth brings new ease of handling. It can be installed aerially, supported by messenger, or underground in ducts.

Anaconda Alpeth is dependable, with an impressive performance record under the roughest service conditions. These are some of the reasons . . .

All pairs guaranteed. Each pair is individually inspected and checked at the plant . . . your insurance for quality construction and performance. Simplifies records because there are no faulty pairs of which to keep track.

Polyethylene-insulated conductors – have excellent electrical properties and high moisture resistance. Rain, snow, high humidity, the heaviest weather–through them all Alpeth stays on the job maintaining service.

Aluminum shield, longitudinally applied. Here, for the first time in plastic cable, is a virtually noise-free cable. Because of its constant, low electrical resistance, longitudinally applied aluminum shielding is far more effective, and offers better lightning protection, than old-fashioned helically applied shields. It provides a *positive* shield whereas the helical shield, with its many noncontiguous areas, could not. *And* Alpeth's shield is corrugated for *extra* flexibility.



ANACONDA ALPETH (Type ALP) plastic-insulated telephone cable. Anaconda also offers other plastic-insulated telephone cables: direct-burial, self-supporting, buried distribution wire; rural, urban, and suburban distribution wires; single-pair parallel distribution wire, inside telephone cable.

High-molecular-weight polyethylene jacket –gives mechanical protection plus high moisture- and corrosion-resistance.

Improved core binder–of high dielectric strength. Resists lightning damage and reduces noise through improved balance.

Improved pair balance–to shield, means less susceptibility to noise.

Uniform capacitance – eliminates expensive test splicing on most repeater circuits.

Cross-talk performance–improved–means superior communication.

Resistance unbalance – reduced – means less noise.

If you are replacing an old telephone system, or installing a new line–why not investigate *all* the advantages of lightweight fully color-coded Anaconda Alpeth. Call the Man from Anaconda about Alpeth or any of Anaconda's full line of plastic- and paper-insulated telephone cables. Or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York, for Bulletin DM-5770 "Plastic-Insulated Telephone Cable."

58366

CALL THE MAN FROM

ANACONDA®

FOR ANACONDA ALPETH
PLASTIC-INSULATED TELEPHONE CABLE

YOUA

were ~~ARE~~ TRAPPED!

The ten-pulse dial, and the resultant decimal system basis for switch design, imposed limiting factors upon direct dial switching equipment—factors that became more and more limiting as the demands upon switching equipment became constantly heavier.

Crossbar switching introduced a new concept of basic design that went beyond the "ten finger" decimal concept.

Crossbar is not just another "type" of switching equipment—it is an advancement that shatters the artificial boundaries of "ten multiple" switching. It brings new trunking capacity and flexibility to telephony.

North By-Path Crossbar brings to the Independent Telephone Companies switching capabilities to meet the challenge of the future.

North Crossbar is the only switching equipment available to you that has been designed and engineered to completely satisfy all the requirements of nation-wide network telephony!

North Crossbar has the ability to route traffic independent of the numbering scheme or number of selector stages! North Crossbar can fully utilize the advantages of multi-frequency signalling on trunk lines! It is adaptable to key sending when such instruments become available! No other system can provide so much traffic handling capacity in so little space.

The operating companies who have already installed North Crossbar recognize the inherent capabilities of this new approach to switching. They are enjoying its efficiencies and economies today.

To learn what North By-Path Crossbar is—and what it can do for you, write North Electric Company, Galion, Ohio for the "NX-1 Fact File"—today.

NORTH BY-PATH CROSSBAR IS ANOTHER ENGINEERING ACHIEVEMENT OF

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

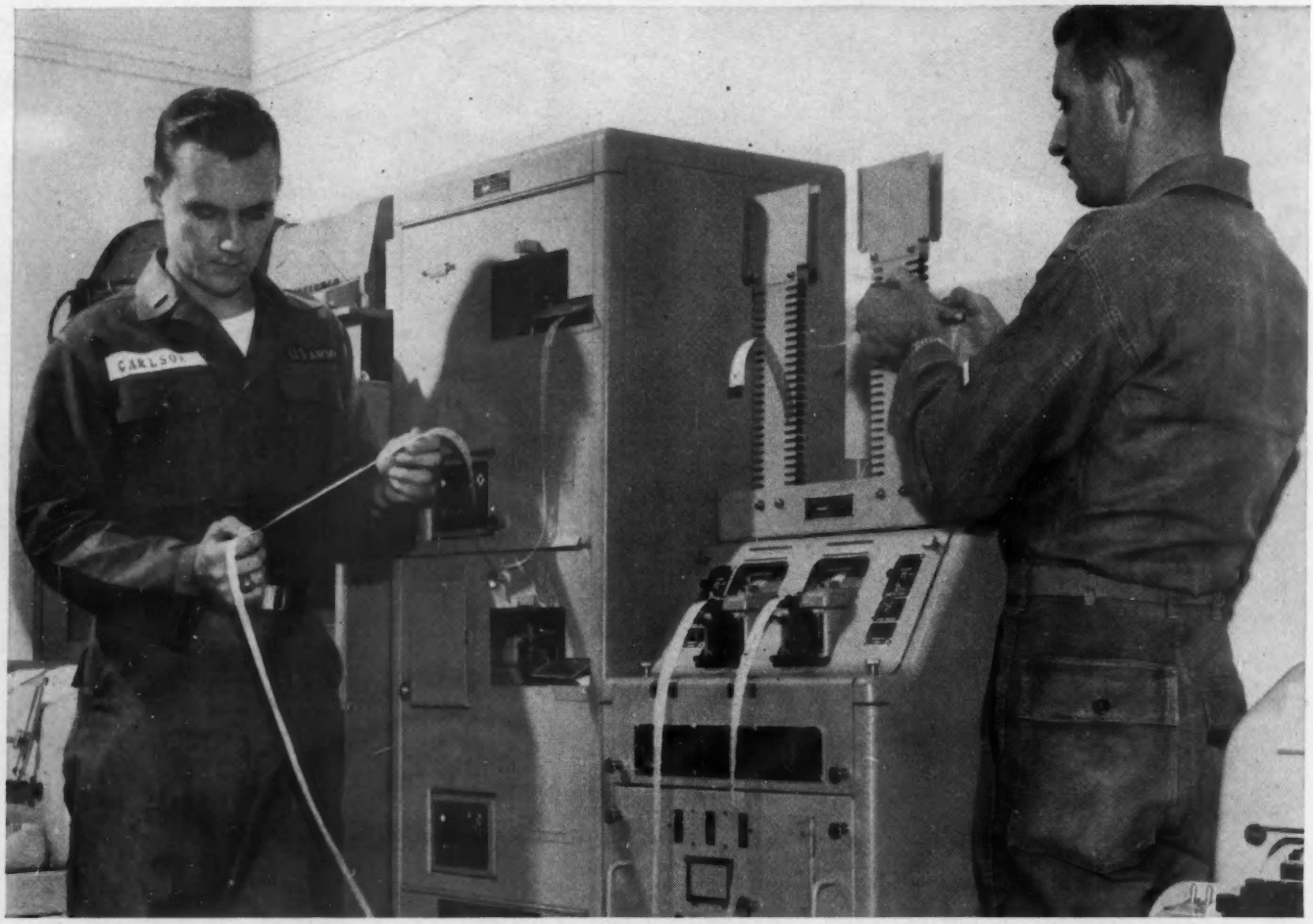
NORTH ELECTRIC COMPANY

NORTH

GALION, OHIO

TOP LEVEL TALK

relayed on teleprinted tape



At U.S. Army field communications centers, Kleinschmidt torn tape relay units send, receive, retransmit messages to widely-dispersed commands

"Getting the word" from top command to outlying units in the field can create a communications traffic jam. This compact relay unit solves the problem. It quickly, accurately, automatically numbers and *prints* each message as it simultaneously *relays* another message to one or 100 receivers in the communications network! Developed in cooperation with the U. S. Army Signal Corps, the unit's applications include telemetering, integrated data processing, torn tape communication. In recognition of Kleinschmidt's high standards of performance, equipment produced for the U. S. Army is manufactured under the Reduced Inspection Quality Assurance Plan.

KLEINSCHMIDT

DIVISION OF SMITH-CORONA MARCHANT INC., DEERFIELD, ILLINOIS

Pioneer in teleprinted communications systems and equipment since 1911

EDITORIAL

Part II — "Formula For Halting Progress"

LONG before we coined the phrase *"Formula For Halting Progress"* as the proper description of a rate formula that insists on holding down rates and setting utility earnings at, or near, starvation levels, our studies proved: — (1) *Financially strong companies can, and do, move ahead faster in putting the products of research to work for their customers; and* (2) *Rates which produce good, but fair, earnings permit companies to do a better-planned, more-economical job that will produce better service at less cost to customers.*

We well know many of the nation's regulatory commissions recognize and give full consideration to such facts. But, our files contain many commission orders indicating some regulators, courting popular appeal of their decisions, have — (1) concentrated almost exclusively on the control of prices and profits, (2) held prices and profits to low levels, (3) moved slowly, if at all, to adjust prices to rapidly rising costs, and (4) failed to recognize the need for keeping profit margins in pace with business activity and the requirements of the company.

We believe such regulatory pre-occupation with prices and profits is one of the main roots of *The Formula For Halting Progress* — low rates which result in service at higher cost than would be attained if the company were allowed to achieve good but fair earnings.

And the records prove our belief is shared by many. In 1957, Commissioner Hunt, of the Michigan Public Service Commission, in his dissenting opinion on the Michigan Bell rate order spared no words in expressing his thoughts on the subject as he said: —

"I firmly believe that the efficient and well managed company should be rewarded and not penalized. A progressive company, well operated, which gives good service and is alert to improve will be able to attract money over the long run at lower cost than will a poorly managed company or one which gives inferior service with outmoded equipment. It follows from this that if each company were to earn only the cost of money to it, the poor company would be rewarded by higher rates to the disadvantage of its customers and the well run company would be penalized . . .

"In utility services, I believe we cannot afford anything but the best. A strong company with good earnings will provide the proper kind of service. It can expand its services promptly to meet new demands; it can improve its facilities to provide the latest and best quality of service; it can offer new types of service as they are developed. A company with good earnings can undertake projects which will, in the long run, result in better service at lower cost, even though they may initially depress earnings because of their high first cost. A company which is held to a low rate of return cannot do these things. I believe that the end result of keeping rates at the lowest possible level will be poorer service at higher cost than would be attained if the company were allowed to achieve good, but fair, earnings . . ."

With those thoughts we are in complete agreement. They add up to a condemnation of the type of regulation that halts the progress of utility companies by allowing only moderate or minimum rate increases that cause the regulated company to lag behind unregulated industry in (1) *profit rates,* (2) *book value and market price of ownership shares,* and (3) *in earnings necessary to attract the money needed to finance expansions and improvements.*

As we understand regulatory duties and obligations, the regulators responsible for such rate orders and the conditions they bring about are overlooking one main responsibility — *their legal duty to strike a fair balance between the rate payer and the investor, and not favor one at the expense of the other.*

In the final analysis these interests are not basically opposed. In fact the records prove that repressive regulation is just what we termed it — *"The Formula For Halting Progress."* It may work to the advantage of today's user, but as the NARUC Telephone Committee said in 1957 *"It may also ultimately work to his grievious disadvantage for many tomorrows . . ."*

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Show Your Complete Line in N

with LEICH's PABX Sales Kit

Ever have trouble showing and comparing PABX systems to a prospect? Leich's PABX Sales Kit is an excellent solution. It lets you show a prospect Leich's complete line of PABX's in a matter of minutes.

A practical, easy-to-read chart tells at a glance the capacity, type of attendant's cabinet, switchboard, and other information about each of Leich's PABX systems.

Individual brochures help you do a more complete selling job. These brochures cover Leich's popular 40A PABX, other PABX's with keyset turrets, and PABX's with floor-type cabinets.

Write for Leich's PABX Sales Kit today.

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for faster, more icier

TYPE	LINES	LINKS	CITY TRUNKS	TYPE OF ATTENDANT CABINET
40A	40 Not expandable	6	10	See Fig. B. May be used with without turret.
88A	88 Not expandable	9	10	See Fig. B. May be used with without turret.
100A	100 Not expandable	10	10	See Fig. A
100C	100 per bay, expandable	15 per 100 lines	See brochure	See Fig. A
100T	100 per bay, expandable.	15 per 100 lines	See brochure	See Fig. B or A May be used without turret.

LEICH

Subsidiary of GENERAL TELEPHONE

in Minutes

How to Sell Your LEICH PABX Prospects

DIAL TELEPHONE SYSTEMS

more efficient business communications

SWITCHBOARD UNIT	POWER	TELEPHONE INSTRUMENTS	STANDARD SERVICE FEATURES	OPTIONAL SERVICE FEATURES
Steel cabinet with hinged doors front & back, 78" high, 48" wide, 15" deep. All-relay operation.	Ringing & talking supply contained in switchboard unit. Standby batteries, if required, are mounted externally.	Standard telephone instruments are used on all Leich PABX's. Push-buttons & special wiring not required.	2-digit local dialing, local links not tied up on city trunk calls. Consultation & transfer service. (SEE INDIVIDUAL BROCHURE)	A wide variety of optional service features is available on Leich PABX's. (See individual brochures for specific features.)
Steel cabinet with sliding doors front & back, 69" high, 96" wide, 15" deep. All-relay operation.	Ringing supply contained in switchboard unit. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing, local links not tied up on city trunk calls. Consultation & transfer service. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back. 69" high, 96" wide, 15" deep. All-relay operation.	Ringing supply contained in switchboard unit. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing, local links not tied up on city trunk calls. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back, 69" high, 96" wide, 15" deep. Power Bay 87" high, 24" wide. Trunk Bay 87" high, 20½" wide, 15" deep. All-relay operation.	Ringing supply mounted on Power Bay. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back, 69" high, 96" wide, 15" deep. Power Bay 87" high, 24" wide. Trunk Bay 87" high, 20½" wide, 15" deep. All-relay operation.	Ringing supply mounted on Power Bay. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing. (SEE INDIVIDUAL BROCHURE)	

ATTENDANT'S CABINETS

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.

SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO

SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

manufacturers of telephones, switchboards and related apparatus since 1907

ITT CABLE
ITT CABLE RINGS THE

Exceeds all standards!

ITT Cable, long in use throughout the United States, is available to all independent telephone companies.

ITT Cable exceeds every exacting standard of telephony, it features unit and layer construction. The copper conductor and paper insulation is furnished by the largest U. S. supplier of these commodities. ITT Cable (aerial or direct burial) is available in all gauges—19, 22, 24 and 26. All reels are disposable to eliminate additional costs involved in returns.

Backed by both Kellogg and the world-wide facilities of International Telephone and Telegraph Corporation, you will find this cable exceeds the high standards of modern communications.

Ask your Kellogg Regional Office for a comparison of technical specifications against your present supplier of cable.

8 billion conductor feet in USE in U.S.A.

SERVING THE LARGEST SINGLE TELEPHONE SYSTEM!

Basic Specifications	26 AWG	24 AWG	22 AWG	19 AWG
Sheath: lead with 1% antimony				
Conductor: pure copper wire				
Conductor Resistance max. ohms/mile @ 20° C	230	145	92	46
Mutual Capacitance 900 cycles A.C., mfd/mile, max.	0.080	0.080	0.090	0.084
Capacitance Unbalance 900 cycles A.C., micro-microfarads	*	*	at 22 AWG: up to 1000′—100; 1001′ to 2000′—150; 2001′ and longer—200 at 19 AWG: up to 1000′—100; 1001′ to 2000′—150; 2001′ and longer—200	
Dielectric Strength: 60 cycles A.C., for 2 sec., volts rms				
conductor-to- conductor-to- sheath	355	355	355	500
core-to- sheath	850	1000	1000	1000

Insulation Resistance: not less than 1,000 megohm-miles at 60°F measured with a D.C. potential of 100 to 550 volts.

*not required, except if adjacent pairs are found with like lengths of twist when the 900 cycle A.C. capacitance unbalance shall not exceed 400 micro-microfarads.

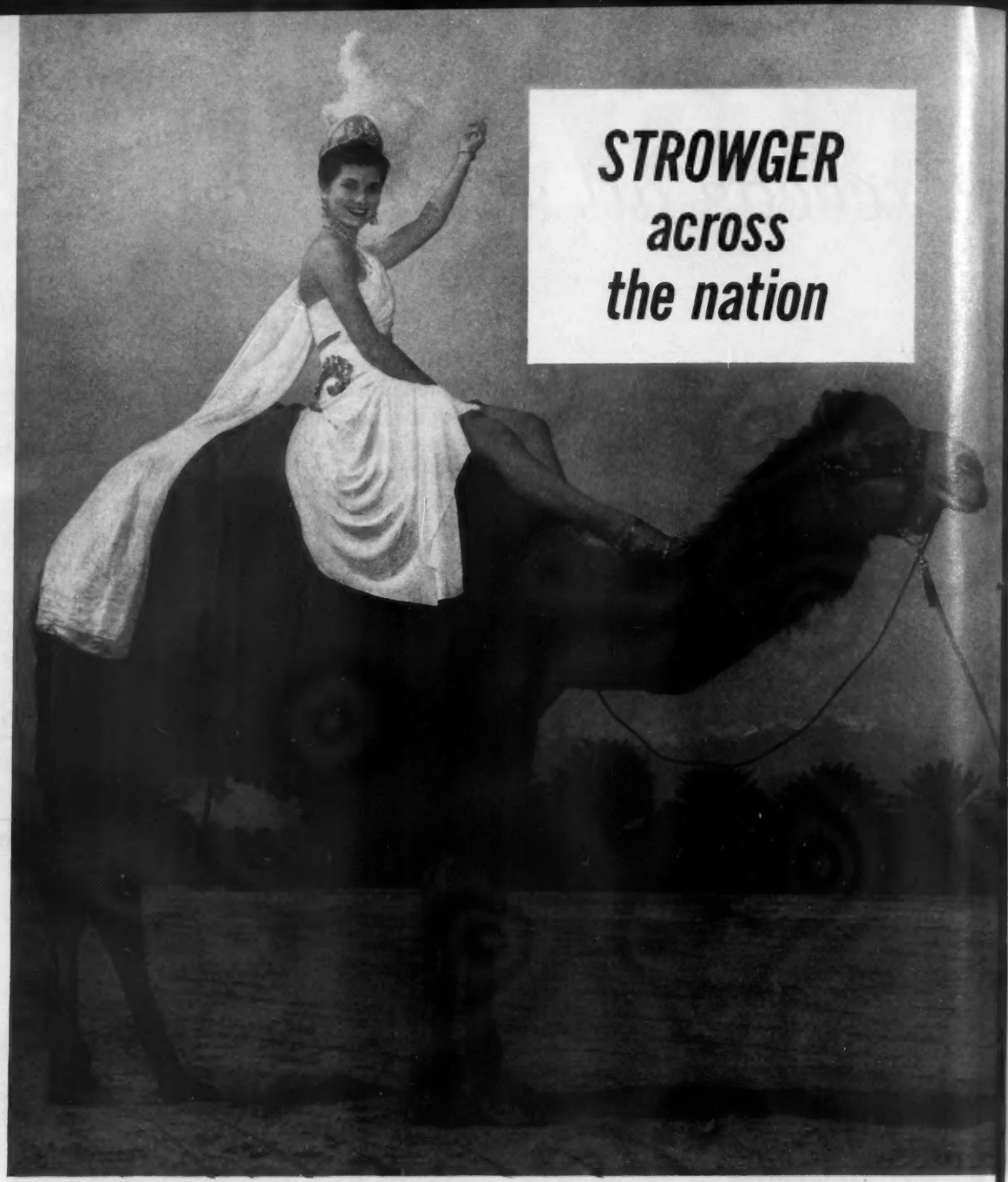
Licensed under patents of American Telephone and Telegraph Company and Western Electric Company, Incorporated

KELLOGG Communications Division of IT&T
CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Illinois
Communications Division of International Telephone and Telegraph Corporation.

Regional Offices and Warehouses: †
CALIFORNIA: 23 Broderick Road, Burlingame, Calif., OXford 7-5780.
GEORGIA: 1594 Southland Circle, N.W., Atlanta 18, Ga., SYcamore 4-2441.
ILLINOIS: 4600 So. Tripp Ave., Chicago 32, Illinois, CLiffside 4-4300.
KANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418.
MINNESOTA: 6100 Excelsior Blvd., Minneapolis 16, Minn., West 9-6715.
NEW YORK: 327 North West Street, Syracuse, N. Y., HArrison 2-0251.
OHIO: 1555 West Fourth Street, Mansfield, Ohio, LAfayette 4-6511.
TEXAS: 1515 Turtle Creek Blvd., Dallas 7, Texas, RIverside 7-5191.
EXPORT: 157 Prospect Street, Passaic, N. J., PRescott 3-5100.

† *Major inventories are maintained at four strategic warehouses in New York, Chicago, Kansas City (Kan.), and Burlingame, Calif., to guarantee ready access and prompt delivery.*



QUEEN SCHEHERAZADE of the National Date Festival and Riverside County Fair. Each February, these two events attract some 200,000 persons and focus national attention on Indio. Visitors see an Arabian Nights Pageant, colorful costumes, exhibits and unique camel races.

INDIO, CALIFORNIA

Once a barren wasteland, irrigation from a distant river changed this desert city into the "Date Capital of the Nation"

Within the fertile Coachella Valley, 25 miles southeast of Palm Springs, lies the agricultural oasis of Indio, California. At one time, the entire Valley was arid. With the building of the All-American Canal, precious water was brought 126 miles from the Colorado River to irrigate the land. Now, Indio has almost a year-round growing season and thrives with date palms.

Indio is the business center and transportation hub of Coachella Valley. Popular as a winter resort, its warm, dry climate attracts sufferers of sinus and asthma. At nearby Salton Sea, tourists swim, sail, fish and water-ski. Indio's population, which numbers about 9,500, is growing rapidly. In 15 years, 30,000 residents are predicted.

Indio is served by Coachella Valley Telephone Company. Each day—Automatic's step-by-step switches work behind the scenes to give dependable, low-cost telephone service. Yes, Indio is another success story of Strowger Across The Nation.

DATE PACKING. In this modern packing plant, dates are sorted, graded and packed in assembly-line fashion. The packing of dates, fruits and vegetables is a major industry in Indio. These products are shipped throughout the world.

COACHELLA VALLEY TELEPHONE COMPANY has seven exchanges. Here is the Indio exchange and business office. Indio is a pioneer in dial service, having converted in 1927 with Strowger. Since then, Indio has increased its number of lines to 2,200.

J. C. NEWMAN (center), vice-president and general manager, Coachella Valley Telephone Company, explains the operation of Direct Distance Dialing equipment to B. W. Burkhardt (left), mayor of Indio. Looking on is J. A. Rector, A. E. salesman. Indio installed type BD SATT in 1957.

OVER 90% OF ALL DATES produced in the U.S.A. are grown in Indio. Tall, majestic date palms extend in every direction for miles. Indio and Arabia are the only places in the world where the finest of dates can be grown.

AUTOMATIC ELECTRIC

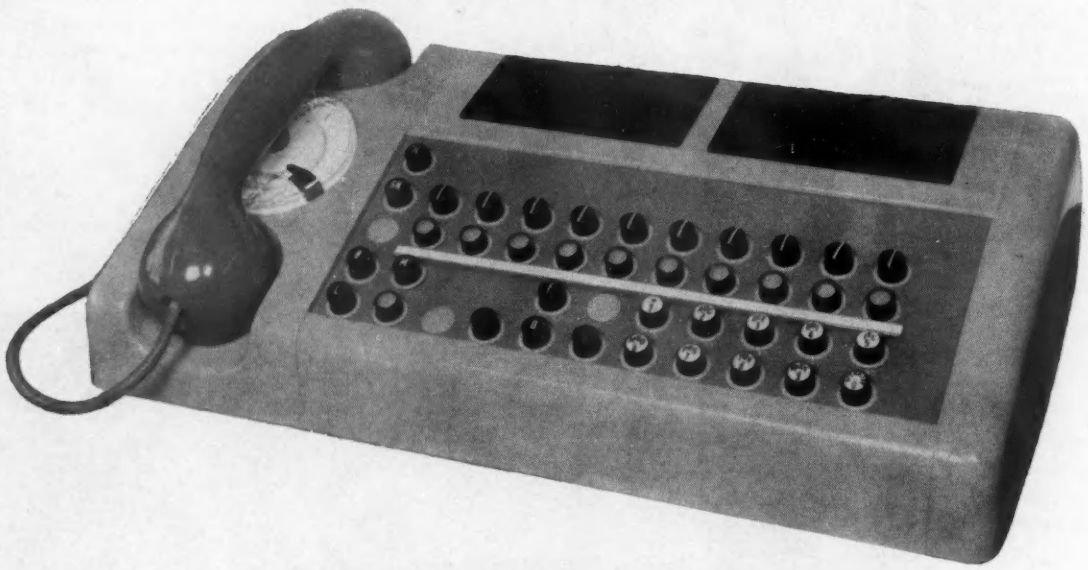
NORTHLAKE, ILLINOIS

Subsidiary of GENERAL TELEPHONE

fast...accurate...complete

night SERVICE

A need is often evidenced among many commercial accounts for a dependable night and week-end answering facility. The USI Type 30 PBX has the built-in answer to the night service inquiries from your commercial subscribers. Furnished as standard with the USI Type 30 System is a wiring provision that makes it possible to convert any station line (with the exception of restricted intercom stations) into a night station that will receive incoming after-hours calls from any or all trunks.



This exclusive USI feature does not limit the normal demands of traffic. At the time stations are being used for night answering, local as well as outgoing calls can still be made with no departure from ordinary dialing procedure.

USI CORP.

Write, wire or call us today for a free analysis of your communications situation. Ask for Charlottesville 3-5153

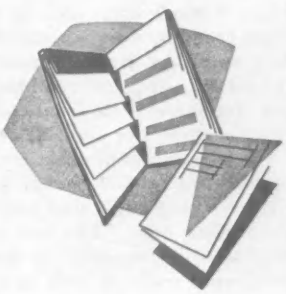
UNITED STATES INSTRUMENT CORPORATION

CHARLOTTESVILLE, VIRGINIA

Part Three (Conclusion) of a Series

What is the largest room in the world? Where is the best place to find a helping hand? Here are some time-tested answers for your immediate use. Chapters One and Two, containing other equally-profitable suggestions, appeared in the October 1, and December 15, 1958 issues of "Telephone Engineer & Management."

EASY DOES IT — And Economically Too



CHAPTER THREE

OF A THREE-PART ARTICLE

By T. DeWitt Talmage*

THE PREVIOUS two chapters of this article emphasized some basic ways by which you can control telephone plant costs — both construction and maintenance. In so doing, the factors that were singled out for attention were chosen because their accumulative economic importance merits continuous review.

This part of the discussion will outline examples of current problems which, if ignored or slighted, will (1) prevent the telephone-using public from getting the full measure of quality of telephone service from plant facilities that they are basically *capable* of furnishing, and (2) interfere with obtaining the most economical telephone operating results.

Keeping both of these key problems under control is the common goal of telephone people — especially those in the plant maintenance department. The fact is that in many telephone job assignments it is required that one or the other of these two goals be obtained — or else.

To be brutally frank, this is one of the realistic reasons why the solving of these two classes of problems keep telephone men on their toes and under never-ending pressure to "deliver the goods."

Now, when you can obtain one of these prime objectives and, at the same time, automatically get the second with little or no extra effort, or expense, you have really hit the constantly sought but illusive "jackpot" as was pointed out in the preceding installment of this article.

As an integral part of your co-ordinated plan of directing and controlling the forces, factors, and functions required to produce results acceptable under today's standards, you should seriously consider interweaving the progressive philosophy that one must not be satisfied to stop when a good job is done. We should strive to do a constantly better job. A very practical and profitable example of this approach is described later in this article.

Such a buttressing feature of an operating program is always a desirable, if not a necessary, one. This is because that with the expected continuing increase in labor costs, company survival itself, in many cases, may well rest on adopting, adapting, and otherwise making

*Educational Manager, Kellogg Switchboard & Supply Co., Chicago 38, Ill.

full use of all productivity increases possible through improved methods, techniques, materials, tools (including testing devices), and machines. All of this is possible because *the largest room in the world is the room for improvement.*

Very often the formula for easily reaching these service and business objectives is quite obvious to the successful practioners or the outstanding "doers." Unfortunately, this obviousness that is so apparent to those who already possess the specific "know-how" can make it difficult, if not impossible, for them to understand any need to explain their successful — and to them, simple — practices to others. In those cases, it isn't any secret, it just isn't told.

Then, again, it isn't told sometimes simply *because no one asks them!*

Value Of Your Versatility

ON THE OTHER hand, when good fortune strikes and you are afforded the opportunity to hear[5] or read about workable, resultful management and cost control principles and application techniques — that is, when the cat is let out of the bag — what do we learn?

We usually rediscover something that most of us already know: that the majority of cases are based on the use of competent, versatile workers that are suitably trained and properly equipped to perform their work safely and efficiently.

This statement, of course, is far easier to say — or write — than to put into operation because the mere possession of a general idea or formula — good as it may be — does not automatically guarantee its profitable application under all circumstances.

Similarly, it cannot be considered a "sure thing" that each one completely understands *all* he should be expected to know about either his own problems or the other fellow's answer to what *seems* to be an identical problem. Therefore, the successful application of a tested method or operating formula to another set of conditions in a different environment, can, and often does, require the use of considerable ingenuity on the part of the applier.

This characteristic of "ingenuity" has always been helpful in the telephone industry. Under today's demanding requirements the generous use of ingenuity is needed to prevent static, unprofitable conditions from developing. Absence of, or failure to exercise, an above-average degree of ingenuity can cause construction and operating costs higher than necessary.

FIGURE FIVE: — Daniel M. Willett, Western Arkansas Telephone Co., Russellville, Ark., is shown above, checking the output frequency of a central office ringing generator with a standard Kellogg portable 2-B frequency meter. This meter, using the stroboscopic principle, permits the easy detection of a frequency deviation as little as one-tenth of a cycle per second, even by inexperienced personnel. The accompanying article, in addition to discussing a well-known fact — that it is cheaper in the long run to use time-saving tools and test equipment — goes further by pointing out: "The use of labor-saving tools and test equipment is necessary in the telephone industry to secure minimum costs *as well as to secure the precise results required today that less accurate and less efficient methods just don't furnish.*" This article also emphasizes a frequently overlooked aspect of this long-known business principle.

In passing, it may be helpful to point out that knowledge of essential economic and technologic fundamentals is a tremendous aid to furnishing mobility in making decisions at the various stages of formulating any overall program. This is another form of versatility that is valuable in any business, including the telephone business.

Your Versatility Pays Off

ONE OF THE classic stories that illustrates, among other things, the versatility required in many communication jobs, concerns a telegraph lineman and his encounter with the proprietor of a combined jewelry and watch-repair store. The jeweler had reported trouble with his store's clock which was leased from the telegraph company. The story goes that on one blustery, snowy day, this lineman in the full regalia of his trade, loaded down with tool belt and tools galore, safety strap at his side, climbers[6] in place, and even with a coil of

Please turn to page 70

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[5] *Opportunity never ceases to knock for anyone who wishes to increase his knowledge or broaden his experience by listening. The missing "L" in learning is "Listening," according to that interesting and helpful book written by Messrs. Nichols and Stevens, entitled: "Are You Listening?" published by McGraw-Hill Book Co., Inc. Listening, being a skill, can be improved through training and practice, just as can reading, writing, and speaking. Read this book, practice what it preaches, and you will bring back still more information from the sessions of the next telephone convention you attend.*

[6] *Also called "spurs" or "hooks."*

GOOD TELEPHONE SERVICE

Starts With Proper Installation

By JOHN S. REED

GOOD installation practices stimulate the plant employe's confidence by enabling him to deal intelligently with the situations that arise in the course of his daily work.

CHAPTER FOUR - Drop Wire Entrances

CHAPTER IV of TE&M's operating manual on station installation discusses methods of making final attachment of drop wires and entrance of drop wire in building. Part III of this manual appeared in the February 15 issue.

BEFORE installing the drop and boring the entrance hole, it should be first made sure that the selected point of entrance will be clear of any obstruction such as the end of a joist or girder and a dividing wall or partition in the basement.

If it is decided to make a basement installation, the drop wire should be brought through the foundation sill header as illustrated in *Figure* 22. Only as a last resort should entrance be made through a basement window frame or the foundation wall.

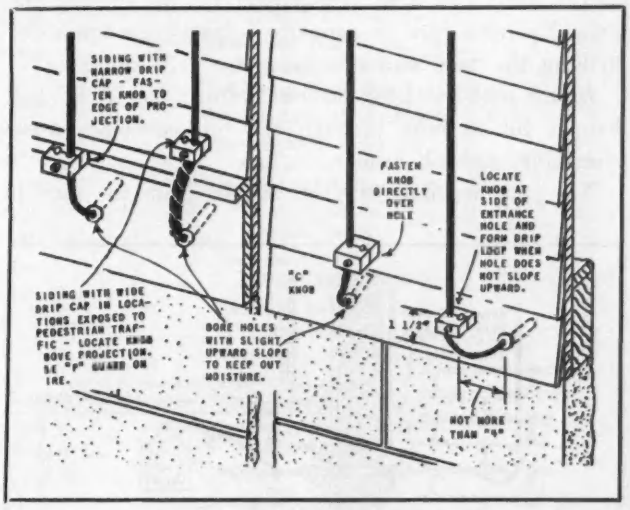
SIDING WITH NARROW DRIP CAP - FASTEN KNOB TO EDGE OF PROJECTION.
FASTEN KNOB DIRECTLY OVER HOLE
LOCATE KNOB AT SIDE OF ENTRANCE HOLE AND FORM DRIP LOOP WHEN HOLE DOES NOT SLOPE UPWARD.
"C" KNOB
SIDING WITH WIDE DRIP CAP IN LOCATIONS EXPOSED TO PEDESTRIAN TRAFFIC - LOCATE KNOB ABOVE PROJECTION. BE "P" GUARD ON LINE.
BORE HOLES WITH SLIGHT UPWARD SLOPE TO KEEP OUT MOISTURE.
1 1/2"
NOT MORE THAN "S"

FIG. 22: — Methods of making final attachment and entering frame building.

Entrance in Frame House With Exposed Foundation Wall

IN CASE of a frame house with exposed foundation wall (*Figure* 23), the proposed location of the entrance hole should be inspected from inside and outside the basement. If necessary, the position of the blocks in the foundation wall with reference to the side of a basement, a corner of the house, a water faucet, or a power service conduit entrance should be observed to locate the exact point of entrance.

The methods of drilling the entrance in houses of

Next page, please

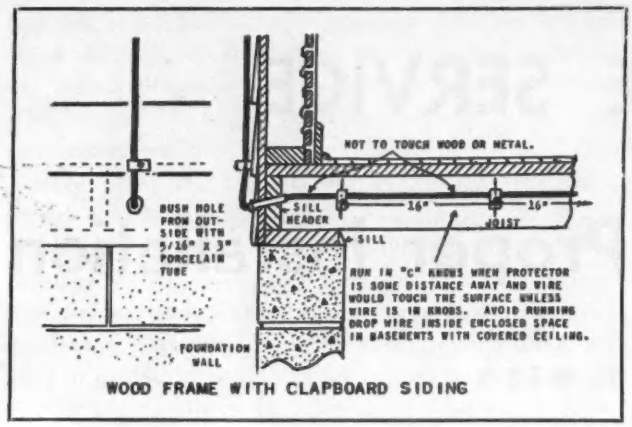
NOT TO TOUCH WOOD OR METAL.
BUSH HOLE FROM OUTSIDE WITH 5/16" X 3" PORCELAIN TUBE
SILL HEADER
16"
16"
JOIST
SILL
RUN IN "C" KNOBS WHEN PROTECTOR IS SOME DISTANCE AWAY AND WIRE WOULD TOUCH THE SURFACE UNLESS WIRE IS IN KNOBS. AVOID RUNNING DROP WIRE INSIDE ENCLOSED SPACE IN BASEMENTS WITH COVERED CEILING.
FOUNDATION WALL
WOOD FRAME WITH CLAPBOARD SIDING

FIG. 23: — How drop wire is brought into building when foundation is exposed.

the various types of construction indicated are as follows:

House with wood clapboard or shingle siding: Bore a hole through the siding or bottom trim in line with the foundation sill header, using a 5/8″ auger bit (for tubes with outside diameter of 9/16″).

House with asbestos-cement shingle siding: Use a push drill to bore a pilot hole through the covering in line with the foundation sill header and ream out the hole with a 5/8-inch bell hanger bit. Continue boring through the sheathing and sill header with the same bit. Use sharp drill bits and apply light pressure to avoid cracking the composition covering. Do not use a hammer type drill or attempt to punch the pilot hole with a nail.

House with aluminum siding (wood sill exposed between bottom of siding and foundation wall): Enter through the sill, using 5/8″ wood auger bit.

House with aluminum siding extending down to foundation wall: Use 5/8″ bell hanger bit for drilling the hole. Exercise care in properly locating the studs for drilling the hole and attaching the "C" knobs.

House with composition roll siding: Use 5/8″ bell hanger bit to bore through the roll covering, wood sheathing, and sill header.

The entrance hole may be bushed from the outside with a 5/16″ x 3″ porcelain tube. (It may be necessary to use two tubes, one from each end in the case of a wide sill or a "double joist."). If the tube does not fit snugly in the hole and the drop wire will not hold it in place, wrap one or two thicknesses of friction tape around the neck of the tube for a snug fit. (Plastic tubes are standard with many companies and may be used in various lengths as needed.)

The drop wire is fed through the tubed entrance and the final attachment of the drop run on the outside of the house is completed.

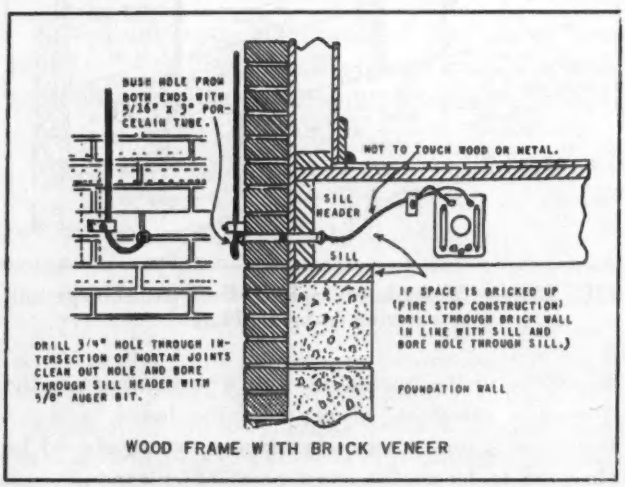
BUSH HOLE FROM BOTH ENDS WITH 5/16" X 3" PORCELAIN TUBE.
NOT TO TOUCH WOOD OR METAL.
SILL HEADER
SILL
IF SPACE IS BRICKED UP (FIRE STOP CONSTRUCTION) DRILL THROUGH BRICK WALL IN LINE WITH SILL AND BORE HOLE THROUGH SILL.)
DRILL 3/8" HOLE THROUGH INTERSECTION OF MORTAR JOINTS CLEAN OUT HOLE AND BORE THROUGH SILL HEADER WITH 5/8" AUGER BIT.
FOUNDATION WALL
WOOD FRAME WITH BRICK VENEER

FIG. 24: — Bringing drop wire into building when foundation is not exposed.

Entrance in House With Concealed Foundation Wall

WHEN A FRAME house with concealed foundation wall (*Figure* 24) is involved, the proposed entrance point is inspected from inside and outside the basement. The position of the basement windows, ventilator grills, outside water faucets, and power service entrance is noted, and if necessary, measurements are taken from one or more of these reference points. The grade entrance of the building should not be depended upon for determining the foundation sill level as this level varies with relation to the threshold of the grade entrance in different buildings.

Drilling of the entrance hole for houses of the construction shown is accomplished as follows:

Frame house with brick or stone veneer: Drill a 3/4 inch hole through an intersection of mortar joints between bricks or stone blocks in line with the foundation sill header. Clean out the hole and bore through the wood with a 5/8 inch auger bit.

Frame house with stucco on metal lath extending down over foundation wall: Drill hole through the stucco covering in line with the foundation sill header, using an old 5/8 inch bell hanger bit. After going through the stucco, change to a sharp 5/8 inch bell hanger or wood bit to bore through the header.

In some cases, the space between the foundation sill and the basement ceiling may be bricked up to provide a fire stop. It may be possible to bore through the sill instead of the header to avoid the necessity for drilling through the fire stop. In the case of thick foundations, there may be additional bricks in the rear of the sill which will have to be drilled through after boring through the sill.

Basementless residence with attached garage or utility room suitably located for a satisfactory wire entrance: Entrance may be made through the boxed eaves into the garage, or through the outside wall into the utility room as indicated in *Figure* 25.

Drop Wire Run From Entrance To Inside Protector

WHEN A DROP wire run does not enter through a service conduit, the run between the entrance and inside protector should be installed in such a manner that the wire cannot touch, or be moved into con-

Please turn to page 76

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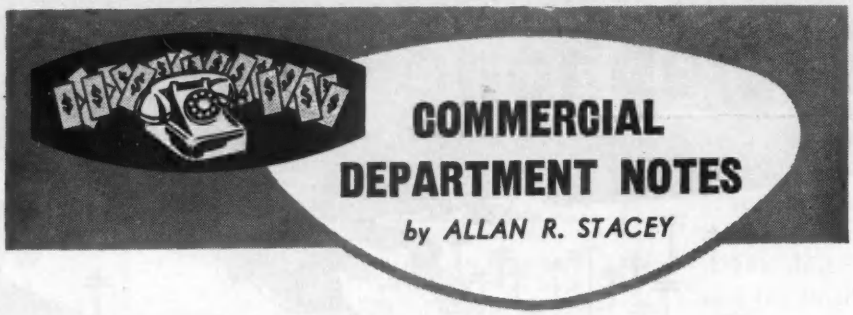


"What's Your Uncollectible Ratio?"

THERE are three important areas of customer credit: (1) credit given the subscriber the first time you meet him; (2) the amount of credit you allow your subscriber; and (3) the credit allowance you make when he challenges a toll billing.

EXTENDING credit to telephone subscribers can be a truly vexing problem. On the one hand you want to do all you can to encourage a customer to subscribe to your telephone service and use it to the fullest. But, on the other hand you don't want his usage to run beyond the limit of your ability to collect the charges.

How far then do you extend customer credit? Let's look at three areas: the credit you give the subscriber the first time you meet him; the amount of credit you allow him in paying his monthly bill; and the credit allowance you make when he challenges toll billing.

The author, ALLAN R. STACEY, is vice-president of the Sunland-Tujunga Tel. Co., Sunland, Calif.

The First Time You Meet

THE FIRST decision to be made is whether you will accept an order for service from a customer who telephones into the office and does not appear personally. We used to demand that the subscriber make a visit to the business office and plank down the first month's exchange rental and the service connection charges in cash before we would authorize the service.

This is no longer true. One company I know will accept orders over the telephone or through the mail and demand no advance payments whatsoever but instead bill the subscriber in the normal billing round and as a consequence he does not pay his first month's exchange rental or his service connection charges until forty-five or more days after he has started the service. A second company will accept telephone requests for service but attempts to collect the initial charges from subscribers who walk into the business office.

Must He Come To The Office?

REMEMBER how we used to strive to obtain the customer's signature on an order for service? It appears that we as an industry now are encouraging the practice of installing telephones without actually seeing the subscriber and without obtaining his signature on any document of authorization. We are now finding that our position legally is just as good. Cases of uncollectibles carried to the small claims court apparently proceed about as well without the customer's signature on the original order. In most instances this practice does not result in higher ratio of uncollectibles but care must be exercised when attempting to apply the practice to unusual serving areas such as resorts or those with highly seasonal telephone demand.

Demand A Deposit?

SEVERAL companies with whom I have talked make use of a deposit in one form or another. For example, one company attempts to collect a deposit of $60.00 on business accounts and $30.00 on residence accounts where the apparent credit of the subscriber is poor. They rely upon the service representative taking the application to analyze the credit status of the individual based upon how long he has worked at his previous job, whether he owns his own home, how long he has lived at one address and his type of employment.

Using this deposit method presents the problem of what to do when the account becomes delinquent in an amount less than the deposit. For an example if you have a $60.00 deposit and the account becomes delinquent $45.00 do you remove the $45.00 from the customer's deposit and then attempt to get him to reinstate his deposit? Or, do you disconnect the account anyway for the amount due and use the deposit to protect your collection of the dollars owing you?

One company tells me that they tried the deposit technique and then gave it up because of the accounting difficulty of charging the deposit for the delinquent amount due. Instead, this company makes use of the deposit to discourage service to extremely bad risks. In other words, where the applicant is obviously a transient or an otherwise very poor credit risk the quotation of a good stiff deposit will cause him to decide not to take the telephone service. Provided it is used with discretion this practice might have some merit.

There are times when the ability to demand a deposit can be most helpful. Providing your Public Utilities Commission is agreeable a simple condition in the filed tariff will per-

mit this. Such a condition might read: "A deposit may be required when credit references available to the company give indication that the applicant has an unreliable credit history."

Pay On Time

WHEN THE company does desire to collect the first month's exchange rental and service connection charges in advance of installing the service the problem sometimes arises that the total of these charges is a real barrier in the customer's mind and he decides to take less service. If the service representative has done a good selling job and suggested such things as colored telephones and adequate extension usage the initial charges can frequently run up to thirty or forty dollars. When the applicant looks at this forty dollar amount he says, "Whoa."

Since our objective is to get the service into the premises and have it pay for itself over the months ahead several companies have adopted the practice of permitting time payments in one form or another. One company permits the initial charges to be spread over the first five months of service with a minimum amount per month. Another company permits dividing the initial charges into multiples of $20.00 or more and taking several months to pay. These are two good techniques and do permit placing more service than might otherwise be sold.

Once The Service Is In

AFTER THE service has been installed you hope that the customer will pay regularly and never have to be reminded. However, since our customer is human he often does not pay regularly and has to be reminded in one way or another. In the old days, we used to send the original bill, a delinquent notice, a final notice and then make a personal telephone call before disconnecting the account. Today, perhaps in line with the faster tempo of living, many companies are sending the original bill and including upon the face of it language to the effect that it is due immediately and becomes delinquent within fifteen days. Then they send one, and only one, disconnection notice containing a specific date upon which the service will be disconnected if payment is not received.

An example of the language used on the bill form is: "*If this bill is not paid within* 15 *days from date of presentation, service may be discontinued, in which event restoration will not be made until this bill and the service charge have been paid.*"

An example of the single disconnect notice sent 25 days after rendering the original bill is: "*Possibly through an oversight you have neglected to pay this bill. Although service is subject to discontinuance* 15 *days after presentation of the bill, we have extended this period. However, unless your remittance is received in our business office by* 5:00 *P.M. of the above due date, we shall be obliged to permanently disconnect your service until the above amount plus a four dollar service charge have been paid in accordance with notice on your regular bill. If there is any question concerning your account we shall be pleased to hear from you, either in person or by telephone.*"

The due date and the amount are inserted above.

Do You Keep Your Word?

SOME COMPANIES in the past have sent notices stating that disconnect was going to occur at a certain time and then have extended that time without further notification to the customer. One commercial supervisor speaks strongly against this practice and says, "Unless a subscriber knows that you mean what you say, attempting to collect on a given date is hopeless." Most companies experience indicates that it is best to give a subscriber a specific date and then follow up as closely as you can to that date.

Why Telephone The Delinquent?

CERTAIN companies not only send the subscriber a delinquent notice through the mail but as a last resort make a telephone call to his premises to tell him that he is delinquent. Today, we wonder whether this isn't wasted effort.

Perhaps the best thing to do is to send one, single, disconnect notice a specified number of days after the original bill and to state on that notice when the disconnect will occur and then go ahead and make the disconnection without attempting a telephone contact.

This becomes a matter of subscriber education and frequently the subscriber if not trained otherwise will wait until he receives the telephone call before he does anything about paying his bill. As we all know the uncollectible accounts are heavily loaded with subscribers who repeat month after month and these subscribers know the procedure just as well as we do. Therefore, in my opinion it is usually a waste of time to make a telephone call to a delinquent residence account.

Here's An Interesting Idea

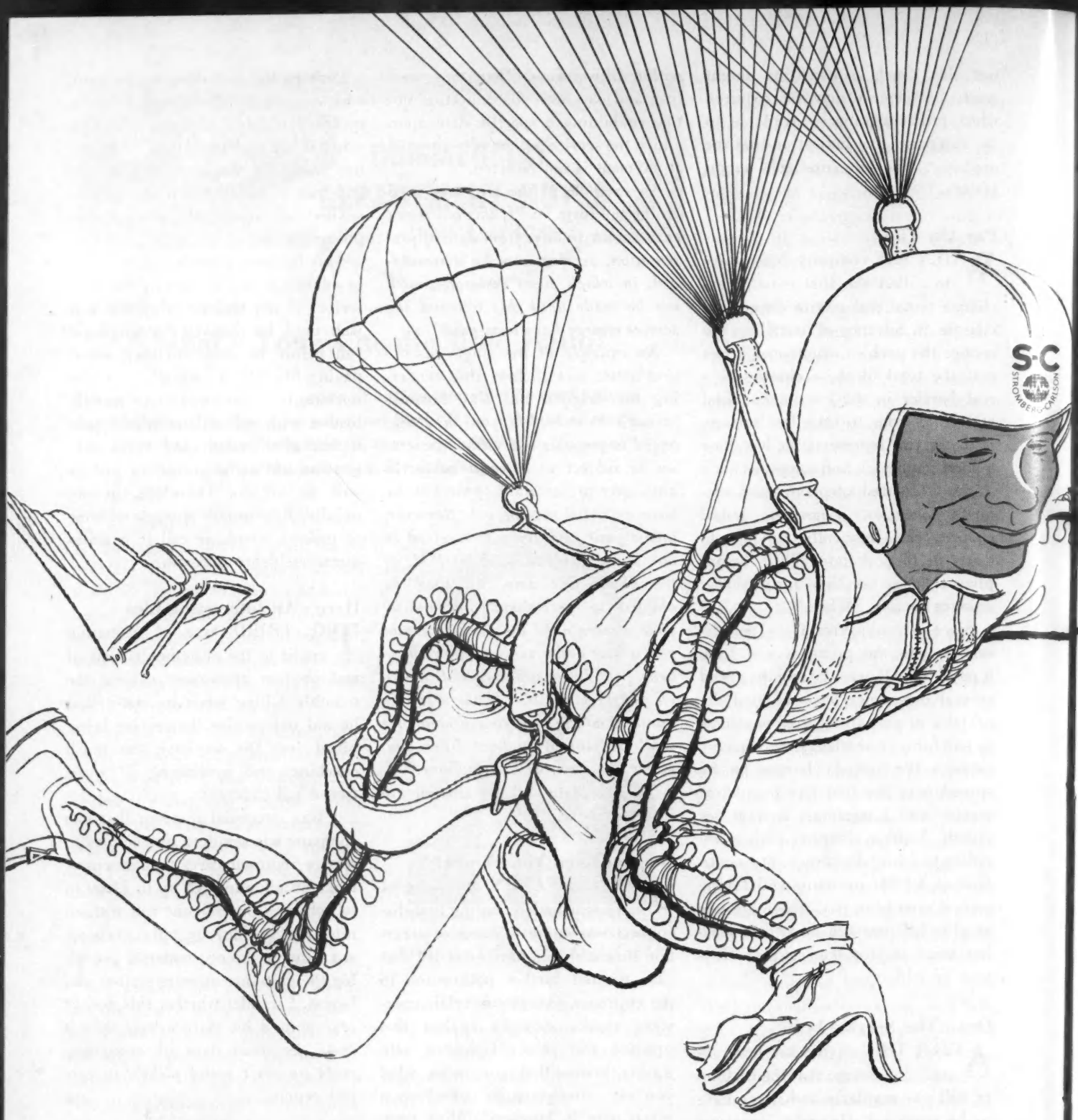
THE THIRD area of extending credit to the customer is that of making him allowances against the monthly billing when he states that he did not receive the service being billed for. Do we have too much checking and processing of questioned toll charges?

I was interested to learn that one company has standing instructions to service representatives that they may make an allowance of up to $2.00 in toll charges on any one bill without referring to files or toll tickets or any other reference material providing the customer appears serious and honest. I wonder whether this doesn't save quite a bit more money than it costs. In these days of ever-rising costs we can't spend nickels to protect pennies.

What's Your Uncollectible Ratio?

FREQUENTLY the matter of extending credit gets down to measurement by the device of the ratio of uncollectibles to gross dollars billed. Some companies have as an objective an uncollectible amount no higher than one-half of one per cent of a gross billing. However, many companies are today experiencing uncollectibles close to 1% of gross billing.

But this is not the total story. Of



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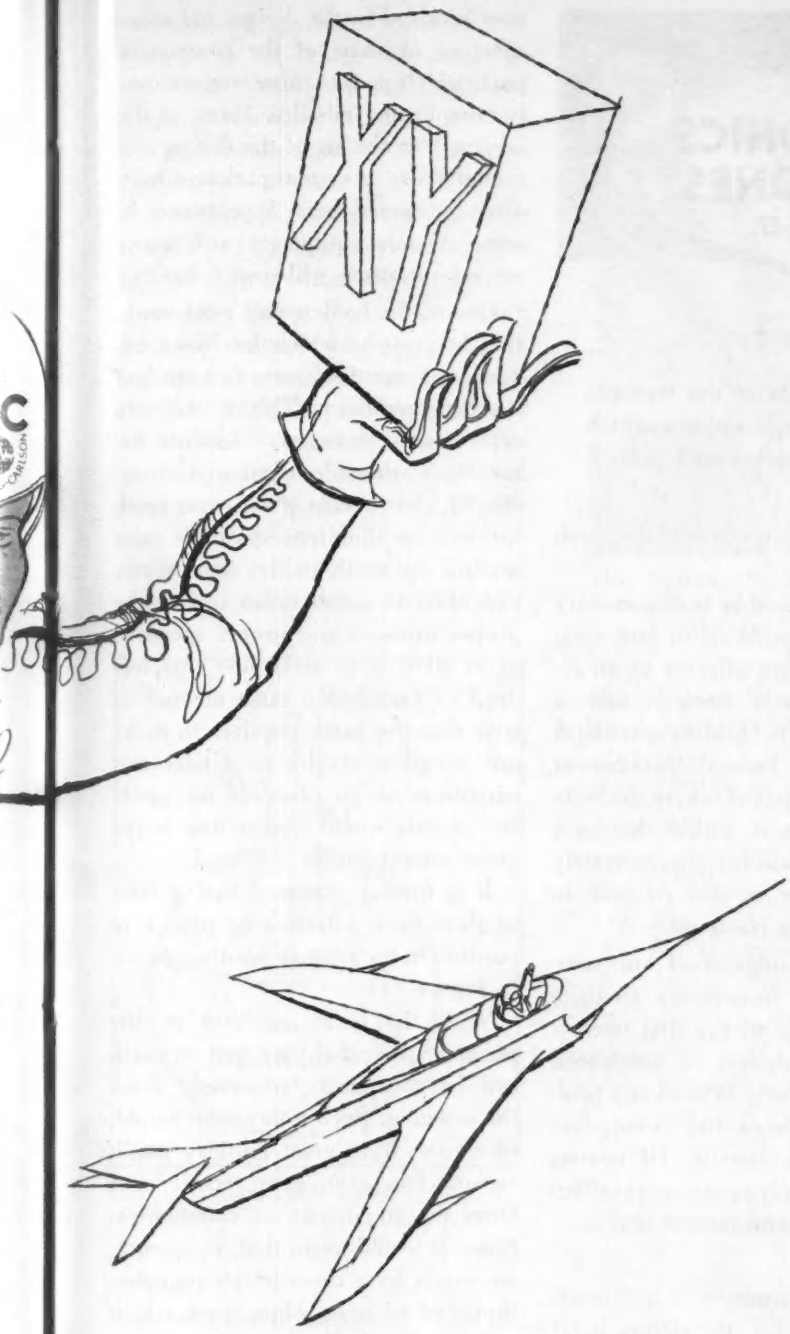

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equal significance to the uncollectible ratio is an answer to the question, "How much are you spending on employee wages and paper and mailing to keep your uncollectible ratio down one point?" Sometimes we brag about a good uncollectible ratio and overlook the fact that the exchange manager and the service representatives are spending too large a portion of their time in treating delinquent accounts and the number of mailings and other notifications to the subscriber are costing far more than necessary.

SUBMIT YOUR PROBLEMS

You are invited . . . to tell Mr. Stacey about your problem of commercial department policy or procedure on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in this column . . . and that could be helpful to you and others with the same (or equal) problem.

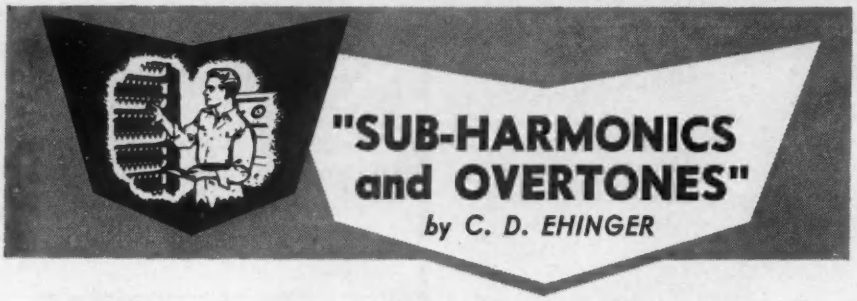
The Editors.

What's Your Experience?

I SHOULD VERY MUCH like to get an expression from you people in the operating end of the business as to what single device you have found to be most effective in collecting the monies due you.

That's all for now. In the next issue we'll see what one aggressive member of our industry was able to accomplish in selling additional services to the butcher, the baker, and the candlestick maker.—*Allan R. Stacey.*

"Here's a perfect spot for a rock anchor!"



"SUB-HARMONICS and OVERTONES"

by C. D. EHINGER

"Satellites And The Industry"

THE telephone industry will shortly taste the fruits of the tremendous research programs responsible for the strange objects which are "making a junk yard out of our previously uncluttered skies."

Time To Do Some "Boning-Up"

I DON'T KNOW about the rest of you, but since the advent of Sputnik, Explorer, Vanguard, and all of the rest of the strange and multitudinous objects which are beginning to make a junk yard of our previously uncluttered skies, I have found it necessary to do a little boning-up on some long forgotten basic principles of physics and, in addition, to sit down and do a bit of cogitating as well.

The point I am making is that I don't think my grade school youngsters are much different than yours and I suspect that a great number of you have probably had this same experience. The children, especially David, who is now in the sixth grade, have swamped me with questions: — *"What keeps 'em up, Daddy?"* — *"Why don't they fall down?"* — *"How big are they?"* — *"Who owns them?"* — *"Why do they want to put them up in the air?"* Even my wife, Peg, gets in on the act by asking *"Why in the world do they want to explore outer-space when we still haven't learned how to solve a lot of problems here?"*

Up to this point I have been able to keep the children satisfied with my answers (I dread the day when they learn the Old Man actually has a very limited knowledge about an extremely narrow range of subjects and, of course, it goes without saying that Peg learned that fact long ago) but, whether we like it or not, today's happenings at Cape Canaveral and in the remote spots of Siberia are affecting each one of us, individually, and our telephone companies, collectively.

I don't believe that it is necessary to belabor the point as to how each one of us is being affected as an individual. We only need to take a quick look at the healthy chunk of loot which the Federal Government takes out of our pay check, in the form of income taxes, to realize that each one of us has paid for approximately one lock-washer or nut or bolt in each missile that blasts off.

From the standpoint of our companies, federal income tax chops a tremendous 30% of the first twenty-five thousand dollars of net profit and an unbelievable 52% of any profit over and above the twenty-five thousand dollar amount. Of course, this does not apply to the cooperatives who pay no federal income tax.

Benefits to Come

FORTUNATELY, the picture is far from one-sided. We, in the telephone industry, will very shortly taste the fruits of this tremendous research program and I predict its impact will make itself felt throughout the industry.

As only one small example, the search for greater reliability combined with weight reduction has already created tremendous advances in the art of the use of printed circuits, miniaturization, the use of semiconductors, sandwich materials, and phenolics.

It is a matter of good fortune to us that practically all of the manufacturers of our telephone equipment are also involved in the design and manufacture of some of the component parts which go into these tremendously complicated missiles. Many of the advances in the art of the design and manufacture of system packages have already made their appearance in some of our equipment and many more innovations will soon follow.

One of the boldest and most imaginative projects which has been advanced is one that seems to have had the least publicity. This is the concept of the "stationary" satellite for use in world-wide communications. Briefly, the concept is this — a satellite can be shot into space to orbit around the earth in the same direction that the earth turns and at the proper distance and proper speed so as to allow it to make one complete orbit in exactly the same amount of time that the earth requires to make one complete revolution. Under this condition, to an observer on earth, the satellite would always stay in the exact same position overhead.

It is further proposed that a total of three such satellites be placed in position in the relative position shown in *Figure* (1).

With the three satellites in the positions indicated, any spot on earth can be constantly "observed" from the satellites. Such a situation would, of course, have great military implications but, also, great possibilities from the standpoint of communications. It would mean that, in essence, we would have three telephone poles, thousand of miles high, upon which can be placed all types of antennae,

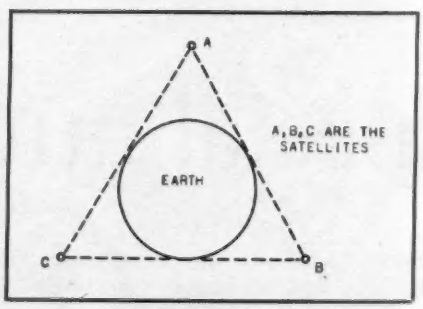


FIGURE ONE.

reflectors, television cameras, and other types of hardware. World-wide communications would then become a practical reality.

Now, for those of you who are

more technical-minded or who may wish to be the "life of the party" at the next meeting of the Clam and Chowder Club, let's quickly go into the basic mathematics of *"What keeps 'em up?"*

It is the old story of tying a string around a rock and then whirling it around in a circle. Centrifugal force causes the stone to fly off into space while the force exerted on the string counter-balances this force and causes the stone to fly in a circular motion, or a different type of orbit if the hand holding the string is moved from one particular point. In the case of satellites, the "hand holding the string" is the gravitational force exerted by earth and is as follows:

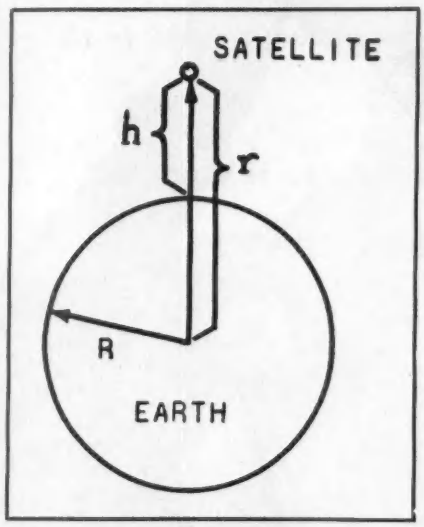


FIGURE TWO.

$P_{grav.} = mg\,R^2/r^2$

Where

m = mass of satellite

g = force of gravity (varies at different points on the earth but is usually considered as 32.2 ft. per sec. per sec.)

R = radius of Earth

r = radius of orbit (R + h)

h = height of satellite above Earth

The centrifugal force can be determined as follows:

$P_{cent.} = mv^2/r$

Where:

v = velocity of satellite

IN THE NEXT ISSUE
Read Mr. Ehinger's TE&M Lab Report on a Printed Circuit Vacuum Tube Voltmeter Kit.

The Author, C. D. EHINGER is president of Citizens Tel. Co., Decatur, Ind.

At orbit, the two forces counterbalance each other. therefore:

$$P_{grav.} = P_{cent.}$$

$$\frac{mgR^2}{r^2} = \frac{mv^2}{r}$$

$$v^2 = \frac{gR^2}{r}$$

but:

$$r = R + h$$

therefore:

$$v^2 = \frac{gR^2}{R + h}$$

$$v = \frac{R\sqrt{g}}{\sqrt{R + h}}$$

Assuming a circular orbit:

$$\text{Period of orbit} = T = \frac{2\pi (R + h)^{3/2}}{R\sqrt{g}}$$

Using the above formulas, it is comparatively easy to figure the required velocity and height of a satellite. The fact that the Earth is not perfectly round, and other factors, causes a more complicated orbit than a perfect circle. Present studies of our satellites' orbits are yielding much information in the attempt to break away from Newtonian Physics into Space-age Physics.

Reference: "Space Vehicles, Satellites, and Missiles Symposium" Pg. 1078 "Electrical Engineering", Vol. 77, No. 12 — *C. D. Ehinger.*

Sub-Harmonics and Overtones

By C. D. EHINGER

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COMPANY: .....

STREET ADDRESS: .....

CITY .....

ZONE ..... STATE.....

*Prices apply to U.S. subscribers.
3-1-59

"Must tell Betty about the dress."

"Wonder how Sue likes her new beau?"

"Aunt Mary would love to talk to the children."

"The Smiths must think we've forgotten them."

"Wonder if Jim is feeling OK again?"

"I owe Frances a call."

THERE'S SO MUCH NEWS TO SHARE—by telephone

News is a lot of fun, especially when it's shared with friends and family by telephone.

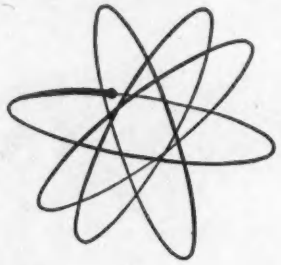
Telling readers and television viewers about the friendly uses of the telephone is one of the pleasantest jobs of Bell System advertising.

This month, for instance, a number of national magazines are featuring an ad entitled, "Reach for your telephone and share the news." This ad and others like it are reminding customers of all of America's telephone companies that phones aren't valuable in emergencies only—but any time there's news to swap and a visit to be enjoyed.

BELL TELEPHONE SYSTEM

TELEPHONE ENGINEER & MANAGEMENT'S

Electronics



NOTE BOOK

By LEO G. SANDS

Prepared for
Educational Division
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan, Chicago 26,
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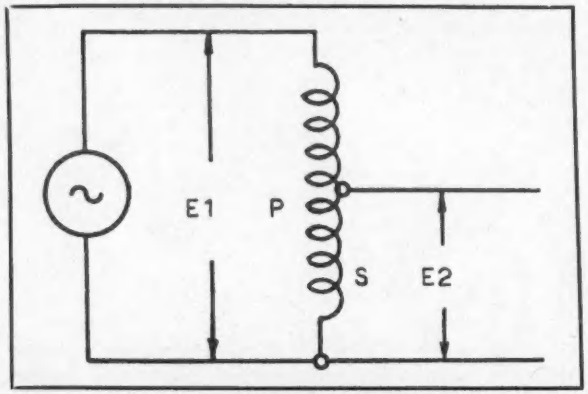
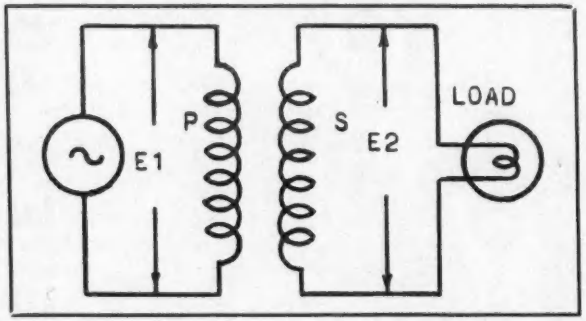
TELEPHONE ENGINEER & MANAGEMENT's
ELECTRONICS NOTEBOOK
By LEO G. SANDS

2.3-5 — Fixed Autotransformer



Here, two inductors are wound as one coil on the same core, and function as a voltage divider. E_2 is related to E_1 in proportion to the turns ratio of P and S.

2.3-6 — Transformer



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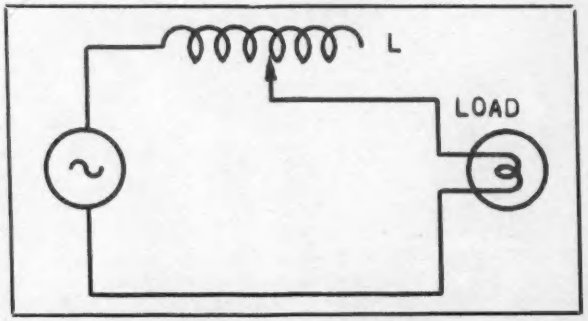
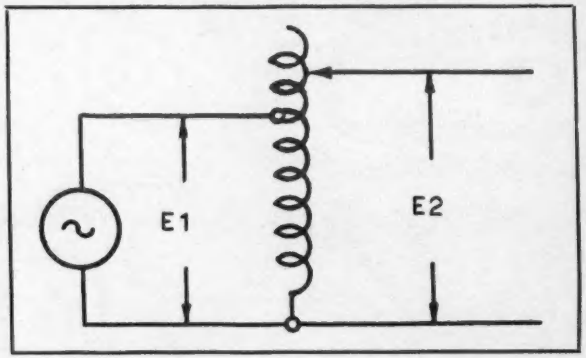
Output voltage E_2 is related to E_1 in proportion to the ratio of transformer primary to secondary turns.

2.3-7 — Variable Series Inductor



Load current can be adjusted with a variable inductor which acts like a rheostat when AC is applied.

2.3-8 — Variable Autotransformer



More Data For Your "Electronics Notebook" on Page 53.

TELEPHONE ENGINEER & MANAGEMENT's

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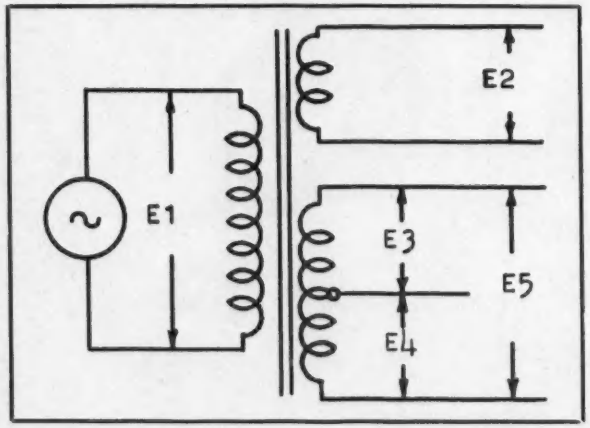
This is similar to 2.3-5 except that the ratio of primary to secondary turns, and hence the ratio of E_1 to E_2, can be varied by adjustment of a sliding contact across the face of the coil, or by selection of coil taps.

2.3-9 — Multi-winding Transformer



More than one independent output voltage may be obtained with a transformer. Here, E_2 is isolated from E_3-E_4. The two output voltages E_3-E_4 have a common connection and E_5 is equal to their sum.

2.3-10 — DC to AC Transformer

A transformer may be used for converting DC to AC and stepping it up. If switch S is rapidly switched from one position to the other, a positive DC voltage will be alternately applied to each end

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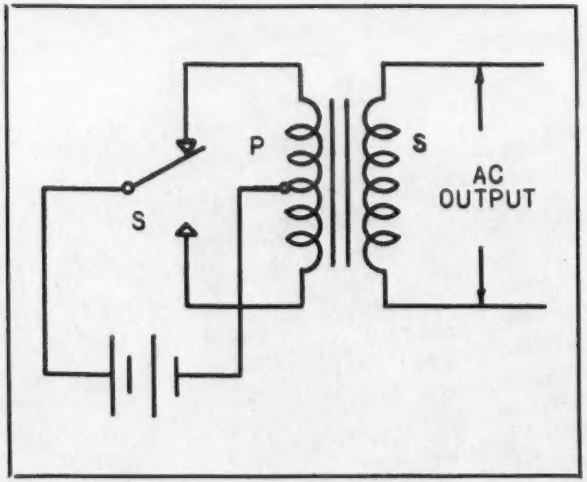

of the primary winding, with negative applied at all times to the center tap. Each time the switch contacts open, an inductive kick (see 2.3-1 and 2.3-2) is reflected into the secondary. Because of the time required for the magnetic field to build up and collapse, the resultant output voltage is AC. In practice a vibrator is used as the switch.

2.3-11 — DC-to-DC Through a Transformer

If another switch is placed into the output circuit, operating synchronously with S_1, the polarity of the output will be kept from reversing with each cycle. This results in a pulsating DC voltage to appear in the output. The pulsations or ripple can be removed with a filter to provide relatively smooth DC.

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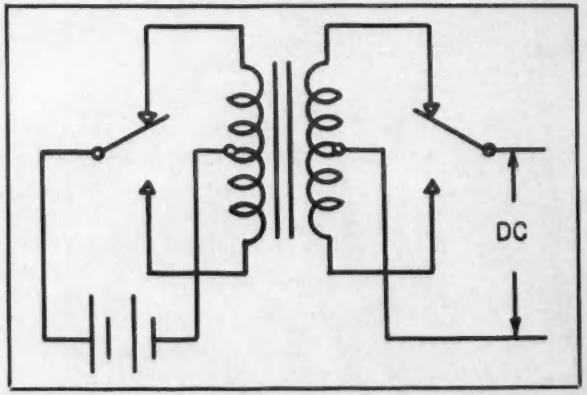
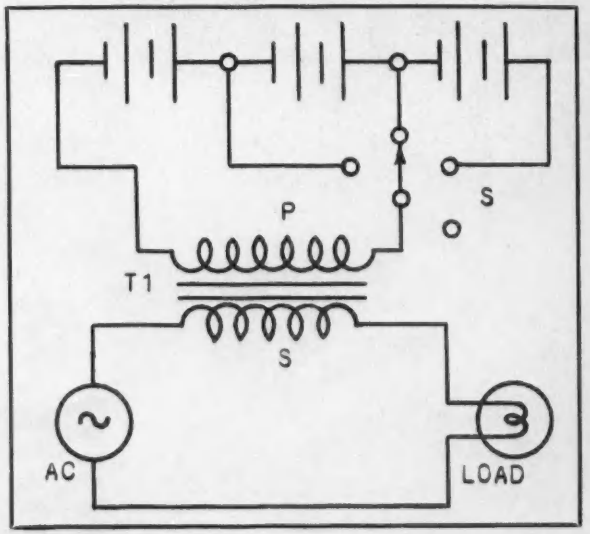
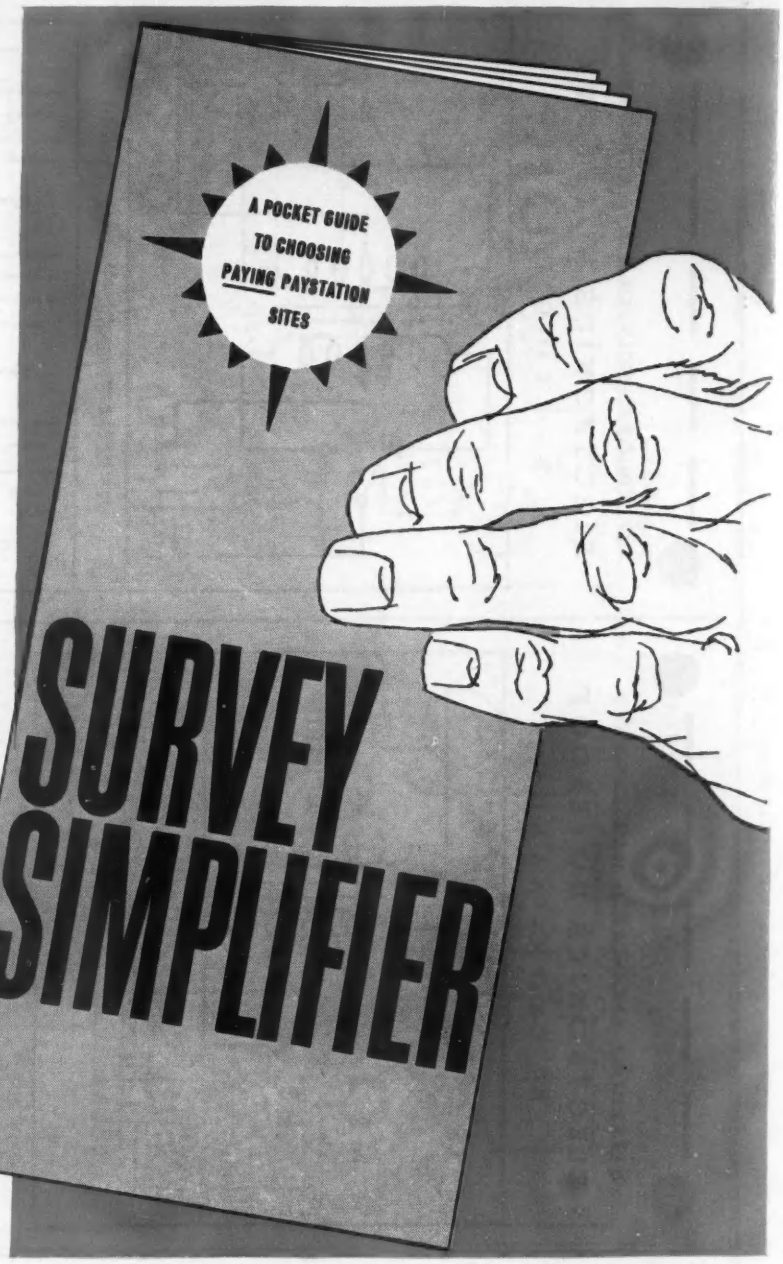


2.3-12 — Saturable Reactor Control



More Data For Your "Electronics Notebook" on Page 55.

new paystation SURVEY SIMPLIFIER



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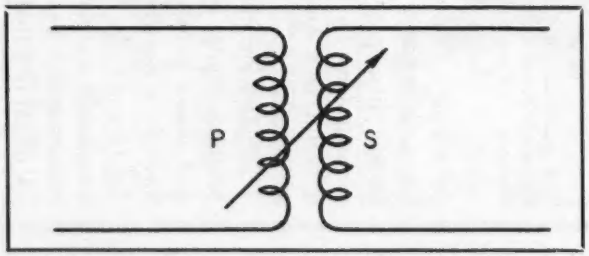
By saturating the core, the inductance of a coil can be reduced, thus reducing its reactance or effective resistance to AC. The degree of core saturation and hence the effective reactance of the secondary of T_1, which is in series with the load, is varied by adjustment of the DC flow in the primary. In the example shown, this is done by selecting the level of DC voltage applied to the primary or control winding.

2.3-13 — Variable Coupling

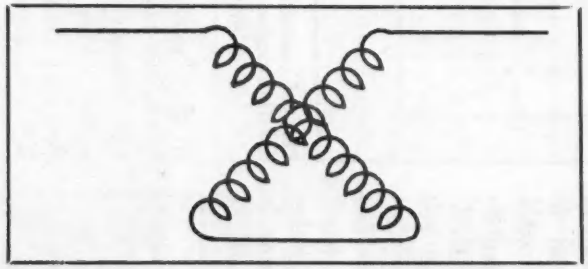
When two inductors are placed so that their inductive fields permeate each other, maximum energy is transferred. When separated or oriented so that



the field of one does not fully embrace the magnetic field of the other, leakage reactance exists, which is used in some applications to advantage.

2.3-14 — Variometer

While no longer in common use, the variometer is an interesting device. It was used in early radio receivers as a tuning device. When its coils are so oriented that their inductances add, the overall inductance is increased. When positioned so that

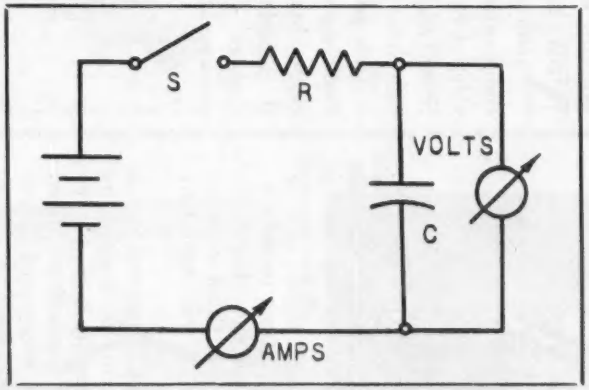


the windings oppose each other, the overall inductance is reduced.

2.4 RC CIRCUITS

2.4-1 — Capacitor Charging

When switch S is closed, current reaches maximum immediately, decreasing exponentially with

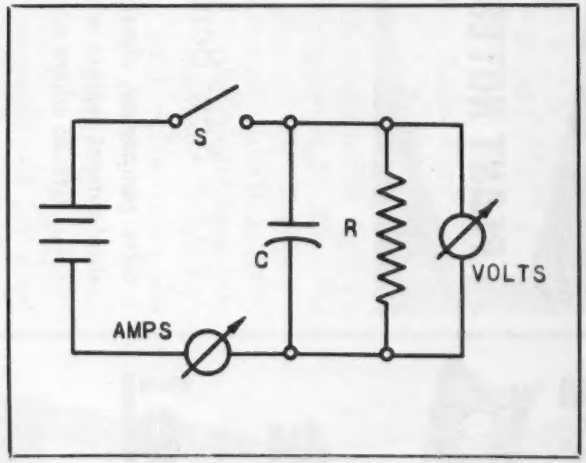


time. The time required for the condenser to charge is known as the time constant, which is the product

of resistance in ohms and capacity in farads. ($T = RC$). Thus, if R is one megohm and C is one microfarad, the time constant is one second.

2.4-2 — Capacitor Discharging

When switch S is closed, C charges immediately, the current rising to maximum almost instantly and dropping off very quickly. When S is opened, the voltage across the capacitor, as indicated by the



voltmeter, will drop off rapidly at first and then more slowly. Since $T = RC$, if C is one microfarad and R is one megohm, the capacitor will discharge in one second. The capacitor is considered as discharged when its voltage drops to 37% of its fully charged voltage.

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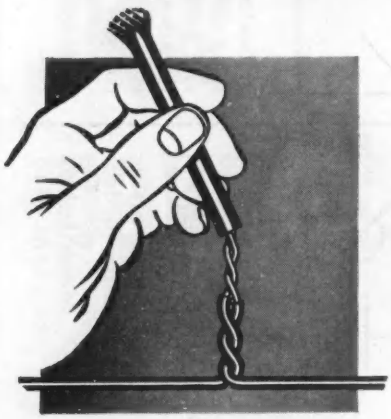

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PLANT NOTES ON NEW DEVELOPMENTS

by JOHN S. REED

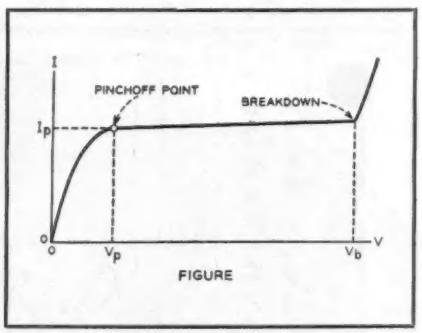
New Semiconductor Material

NEW component, classified as a field-effect varistor, has a constant-current feature which makes it suitable for current regulator circuits where either the load or supply voltage varies.

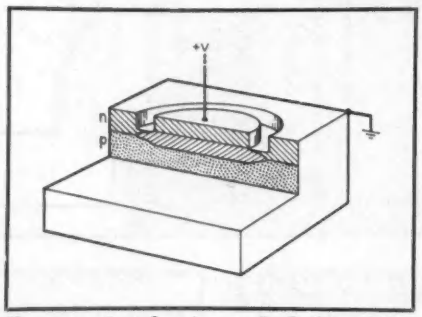
Passive Semiconductor Component for Current Regulation

NEW semiconductor material of interest to telephone and other communications groups has been developed by R. M. Warner, Jr., H. A. Stone and E. I. Doucette of Bell Telephone Laboratories.

This component, which is classified as a field effect varistor, has a constant-current feature which makes it suitable for current regulator in circuits where either the load or the supply voltage varies over wide limits. It can also be employed as a current limiter or pulse shaper. Its a-c impedance is very high, making it useful as a coupling choke or an a-c switch.



Plot of varistor characteristics. Note the flat region between the pinch-off and breakdown points.



Cross-sectional view of field effect varistor. (Courtesy Bell Telephone Laboratories.)

The device contains a single planar junction made by diffusion. Current passes parallel to this junction through a constricted region called the channel. As the voltage across the device is increased, current increases and a depletion layer builds up which eventually reaches through the entire thickness of the channel. At this "pinch-off" point, a further increase in voltage does not produce any increase in current. Eventually, as the voltage is increased still further, an avalanche breakdown occurs. Between the pinch-off and breakdown points, the current is essentially constant as shown by the illustration.

At present the varistors are fabricated by cutting cubes from a slice of germanium or silicon containing a single diffused junction. The cubes are heavily plated on all surfaces, and a circular trench is then cut into the diffused layer to within about 0.1 mil of the junction. As indicated by the illustration, this cutting requires a high degree of precision, since the characteristics of the final device depend greatly on the spacing between the bottom of the trench and the junction. In exploratory work, the trench is first cut with an ultrasonic tool and finished to the desired depth by etching. Leads are then attached by thermo-compression bonding or other convenient means.

Characteristics of the device can be altered by varying the channel depth, impurity gradient, length and width of channel, and the semiconductor material. Units made from silicon have regulated current of one milliampere, pinch-off voltage of 10 volts and breakdown of 150 volts.

Current can be held constant to within 1 percent over a voltage range of 20 to 120 volts. Germanium units with a rating of 10 ma., pinch-off of 10 volts and breakdown of 25 volts have been made. It appears feasible at present to produce varistors which regulate current at any level between 10 microamperes and 10 milliamperes, and improvements in fabrication techniques should make higher current levels feasible.

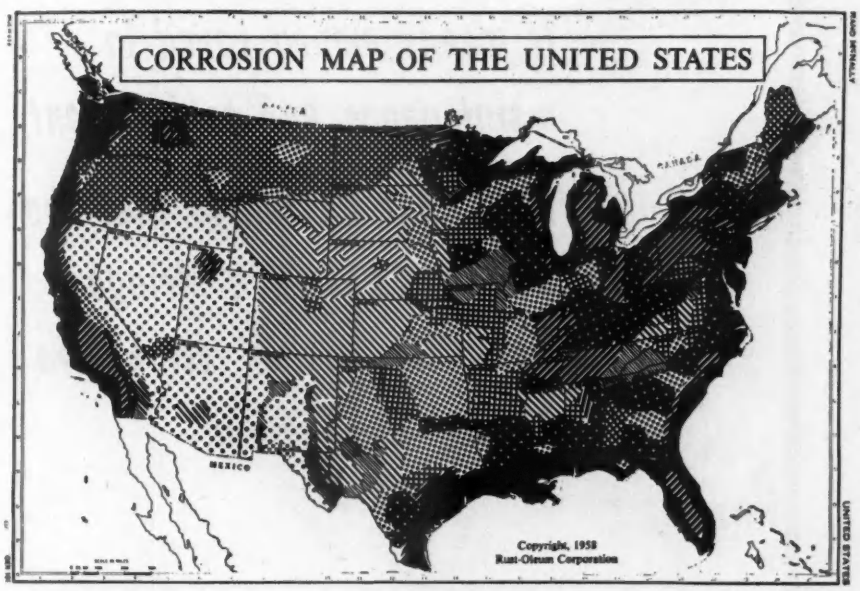
For circuit applications, the varistor has parasitic shunt capacitance in the order of a few mmfd., which must be taken into consideration. In the constant current region, the ratio of a-c impedance to d-c resistance is typically 100 and may run as high as 1000, making it ideal as a coupling device. It differs from the conventional choke in that its a-c impedance is constant over an appreciable frequency range.

Corrosion Rates Vary

TELEPHONE plant men will be interested in the results of a corrosion study conducted by the Rust-Oleum Co., Evanston, Ill. According to this company, the comparative rates at which rust proceeds in different parts of the country have been exactly established for the first time for all United States cities over 10,000 population.

It takes three years, the fastest rate in the country, for rust to corrode a standard, uncoated steel test panel, the size of an auto license plate, in four different cities — Buffalo and Rochester, N. Y.; Erie, Pa.; and Miami, Fla. Slowest rust rate, more than 15 years, is in Tucson, Ariz.; Roswell and Santa Fe, N. M. In all the nation's major industrial centers the rust rate is under four years.

The Rust Index of the United States, published by the Rust-Oleum



Legend

The number of years and months required to corrode an uncoated 28-gauge steel test panel to a severe degree

YEARS AND MONTHS	COLOR CODE	YEARS AND MONTHS	COLOR CODE	YEARS AND MONTHS	COLOR CODE
3.00 – 3.11		6.00 – 6.11		9.00 – 9.11	
4.00 – 4.11		7.00 – 7.11		10.00 – 14.11	
5.00 – 5.11		8.00 – 8.11		15.00 +	

This map shows the rates at which rust proceeds in different parts of the country. The data is compiled in a Rust Index of the United States by the Rust-Oleum Corporation. Thousands of dated and uncoated test panels of 28-gauge steel were left exposed at industrial sites throughout the country to establish the rate of rust in each locality. Every city with a population of more than 10,000 is included in the Rust Index.

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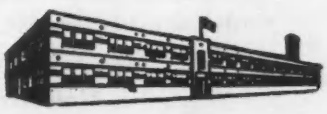

Corporation, Evanston, Illinois, is the result of a 25-year research program, and lists the 523 cities of the country with a population of more than 10,000 and the comparative rust rate for each city. Variations in rate result from the different amounts of rainfall, wind, corrosive gases, sunlight, and salt water present in each locality.

The index was compiled in a mammoth research program, in which dated and uncoated steel panels were left exposed at industrial sites throughout the country. The panels were of 28 gauge, low carbon, cold-roll sheet steel. Thousands of panels were dated and left exposed by Rust-Oleum representatives during the past quarter of a century. Periodic examination of the panels provided the data for the Rust Index. The criterion for the Index was the time it took for the uncoated steel panel to rust to a severe degree.

Of the 523 cities listed, 221, or 42 per cent, were indexed as Class I, meaning that uncoated test panels there rusted in less than four years. Class I rust cities include every major industrial area and most of the nations' secondary industrial centers. In Class II, where test panels rusted in four to five years, are 95 cities. The 316 cities in Classes I and II comprise 60 per cent of the nation's cities with population over 10,000.

Coiled Cords Can Be Reconditioned

COILED CORDS, also called retractable or spring cords, tend to lose their shape and elasticity through constant use and rough handling by telephone users. According to the *Indiana Telephone News*, it is possible to put the curl and spring back into the cords by shop procedures.

As a result of this rejuvenation at Western Electric Distribution Centers, which involves washing, rewinding, and heat treating, 98 percent of all overstretched and kinked, but otherwise perfect plastic jacketed spring cords are made reusable.

At the Western Electric Distribu-

Please turn to page 60

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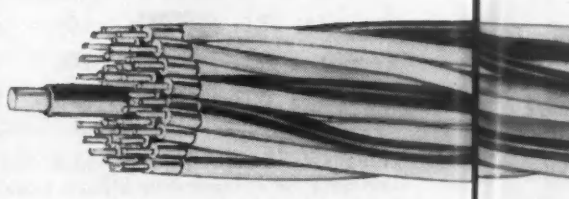

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tion Centers, salvageable cords go into automatic washing machines-just like those found in most homes. Hot water and a special detergent are sufficient for the removal of minor distortions from approximately one-quarter of the cords. If, upon inspection, they snap back to acceptable coiled length — under 12½ inches — they are ready for immediate use.

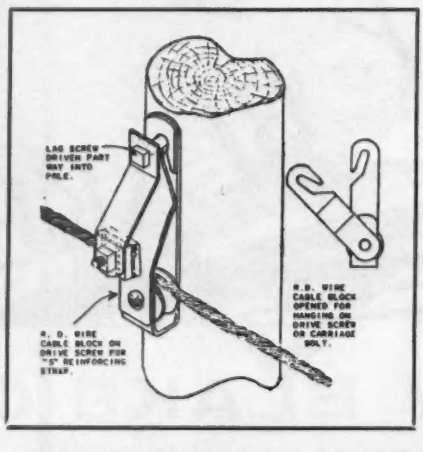
The remaining cords require further treatment. Those not over 18 inches long and not distorted are put on special machines which rewind the coils in the reverse direction. Rewinding restores about 50 per cent of these cords to active service.

The remaining over-stretched and distorted cords undergo additional treatment. They are wound on rods and placed in ovens where heat, under closely controlled temperatures and time conditions, is applied. The heat temporarily softens the plastic covering and restores the spring to the cords. Nevertheless, these too have their coils reversed for even more "kick" — and then put back into service.

EDITOR'S NOTE
Got a problem?? Write it down and send it to John S. Reed, Technical Editor, "Telephone Engineer & Management," 7720 N. Sheridan Rd., Chicago 26, Ill. We'll do our best to give you the correct answer.

QUESTION: We have been installing rural distribution wire to extend service to groups of new subscribers and have run into situations where the rural wire is damaged in placing it. It seems that we have been laying the wire up on lags and brackets on poles and when the wire is pulled up in the sagging test, the insulation is abraded in running over the supports. In one case, we had to replace several hundred feet of RD wire because of damage from this cause. How can that trouble be prevented?

ANSWER: — If you lay the RD wire on lag screws, the bolt head and threads will cut the wire insulation in the tensioning operation. This damage is less likely if RD wire brackets are employed. However, the most satisfactory solution is to employ RD wire cable blocks as pictured below. The sheave has a smooth rounded surface that will not damage the wire insulation and its rolling action as the wire moves reduces the friction and pressure on the insulation.


LAG SCREW DRIVEN PART WAY INTO POLE.
R.D. WIRE CABLE BLOCK ON DRIVE SCREW FOR "S" REINFORCING STRAP.
R.D. WIRE CABLE BLOCK OPENED FOR HANGING ON DRIVE SCREW OR CARRIAGE BOLT.

The sagging sections should be kept short (not over 800 feet and the RD wire should not be pulled around corners with pull greater than 5 feet at the corner pole.

QUESTION: — What simple facts should be stressed to plant people in regard to maintenance of outside plant?

ANSWER:—Outside plant workers should be taught to be on the constant lookout for possible trouble cases in the course of their daily

work. Thus a man on an installation or trouble assignment should follow telephone leads on the way to and from his assignment and keep his eye open for incipient trouble such as broken or "floating" insulators, debris on line wires, uneven wire sags, trees or shrubs growing into the wires, slack guys, and loosened or missing crossarms braces or bolt-nuts. Whenever he sees a defect of any kind, he should correct it or make a notation of it for someone else to handle, if he is not equipped to make the repair or replacement. In addition a regular patrol of all telephone leads should be made at proper intervals to detect and correct all defects.

The program outlined is not new, but there is a constant need to make sure that is followed by all plant workers. A conscientious manager or plant supervisor is aware of his responsibility in this regard. This is always the case, regardless of how small the telephone company may be.

QUESTION: — Do you have any information on the use of a radioactive tracer gas for locating leaks in cable?

ANSWER: — A recent plant conference paper makes brief mention of the method that is used in Europe. In this procedure, an ampoule of randon gas is inserted into the cable under test. This ampoule is first inserted into a fine metal mesh enclosure that is in turn introduced into a plastic hose. The hose is placed in the line between the nitrogen gas tank regulator and the cable connection. The ampoule is broken by squeezing the portion of the plastic hose containing the ampoule with a pair of pliers. This enables a definite amount of radon gas to flow into the cable.

The leak is detected by passing a Geiger counter along the cable until the escaping gas is indicated by this instrument. It is said that no problem of exposure of workers to radiation has been encountered since the amount of radioactive gas is very closely controlled and the work is

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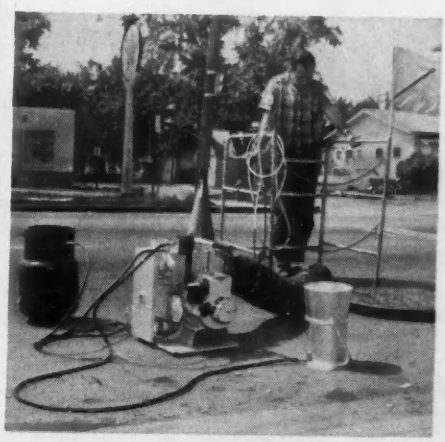

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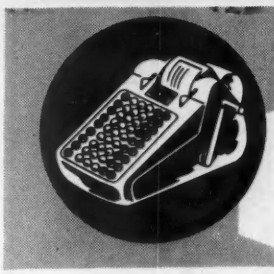
handled by trained personnel. We have no knowledge of this method having been used in the United States, and would appreciate receiving any comments on this point from our readers.

QUESTION: — In a general way, how should telephone poles be located?

ANSWER: — For joint use with a power company, the poles should be located so that electric service wires to the residence or building will not exceed 100 feet in length and if possible will not pass over other property. Pole-to-building drop wire spans are generally limited to 150 feet. In developed areas and in new subdivisions, poles generally are located in the sidewalk area of the roadway opposite property lines for least interference with driveways. With these requirements in mind, spacings between poles will depend on the kind of facilities to be carried on the poles and on the nature of the terrain, high locations usually being picked for poles where possible so as to obtain the maximum ground clearance. Spacings may vary from as little as 75 feet in towns to as much as 600 feet in rural areas.

QUESTION: — Is there a type of paystation that can be used on party lines?

ANSWER: — Special equipment is available that enables the use of a post payment type (not semi-postpay) paystation on party lines. This is a tone identifier which is a transistorized tone generator incorporated in the paystation bell box. By this means, the required paystation tone is transmitted to the operator on toll calls, enabling her to recognize that a paystation is calling rather than a flat-rate station on the same line. This set up requires that the toll trunks be arranged to return and maintain reverse battery supervision when an operator answers. The paystation tone identifier is suited for areas where the revenue is low or seasonal as in resort areas, rural stores, and filling stations.



ACCOUNTING NOTES

by G. M. JONES

"The Departmental Budget"

USING the relationships described in the February 15th issue, here's how to construct a departmental manpower budget summary that will enable you to make use of available manhours and plan for avoidance of overtime.

Constructing The Departmental Budget

WORKING from such relationships as may be suitable for the particular department, projected manpower requirements for each of the department's activities are carried to a manpower budget summary. The totals of the manpower summary give a clue to the amount and timing of probable idle time and overtime and will indicate approximately when the amount of manpower consistently needed reaches the point where hiring is indicated. From the schedule of manpower it is possible to move toward rescheduling of some maintenance or deferrable activities to make use of available man-hours, and to plan for avoidance of overtime.

Vacation schedules can also be roughed out in advance; this is a help to employes in making their own plans. *Table Three* is constructed to show the accumulation of labor for all the imaginary activities of an imaginary department, and the resulting average or shortage of manpower for each month. The table is built up from a series of projections of labor requirements for all the kinds of work that this imaginary department does. The projections are based on the kinds of relationships in *Table One*, in the several activities, applied to expected 1959 activity levels.

Several inferences can be drawn from *Table Three*:

(1) Additional manpower will be needed by this department, beginning in February. A decision will have to be made at a higher level whether to obtain this manpower by hiring, by overtime, or by shared time.

(2) Temporarily, excess hours will be available. A shift in some of the work from later months, or a shift in training course assignment from April and May to January and February, may relieve the early idle time as well as later overtime. At a higher level, a solution for January-February idle time may be found by temporary assignment across departmental lines.

Up to this point, the departmental budget procedures have not been concerned with dollars, but with manpower. For cost and financial purposes, man-hours must be turned into dollars, as has been done in *Table Four*. I have assumed that the study of *Table Three* has led to a change in timing of some maintenance work,

TABLE THREE
Summary of Labor Requirements 1959, Dept. SI&R
(Hours)

Activity	J	F	M	A	M	J	J	A	S	O	N	D
A — Tix I & R	134	151	168	160	180	180	196	196	196	168	168	190
B — Station I & R	320	304	324	330	344	340	320	320	380	364	360	372
C — Station Reloc.	50	50	56	50	56	60	56	64	96	72	64	60
D — PBX I & R	12	8	96	32	16	16	16	40	72	24	20	20
E — D/W Repl.	32	24	40	32	40	40	40	40	16	32	32	24
F — Standby	32	32	40	32	40	32	40	40	32	40	32	40
G — Training				80	80							
Miscellaneous	16	16	16	12	12	12	12	16	16	20	16	16
Total	596	585	740	728	768	680	680	716	808	720	692	722
Available— (Present Crew)*	630	600	640	630	640	592	600	584	640	640	640	640
Hours over (short)	34	15	(100)	(98)	(128)	(88)	(80)	(132)	(168)	(80)	(52)	(82)

* After allowances for holidays, lost time, and vacations.

TABLE FOUR
Conversion of Manpower Needs to Budget Dollars
1959, Department S I & R

	J	F	M	A	M	J	J	A	S	O	N	D
Hours required	636	600	660	648	658	620	744	735	808	790	762	743
Hours available	630	600	640	630	640	592	754	738	778	794	762	762
Overtime Hours	6	—	20	18	18	28	(10)	(2)	30	(4)	—	(19)
Regular Pay @ 2.50	$1,590	1,500	1,650	1,620	1,645	1,550	1,885	1,845	2,020	1,985	1,905	1,905
O/T Premium	8	—	28	23	23	35	—	—	38	—	—	—
Vac. Pay	—	—	—	—	—	100	50	100	—	—	—	—
Sick Pay (4%)	64	60	66	65	66	62	75	74	81	79	76	76
Wage Increment(5%)	—	—	—	—	—	—	100	101	107	103	99	99
Total Direct	$1,662	1,560	1,744	1,708	1,734	1,747	2,110	2,120	2,246	2,167	2,080	2,080
Supplements (15%)	249	234	262	256	260	262	316	318	337	325	312	312
Labor Budget—Total	$1,911	1,794	2,006	1,964	1,994	2,009	2,426	2,438	2,583	2,492	2,392	2,392

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S

"SPEC" BOOK

Prepared By
Educational Division
TELEPHONE ENGINEER & MANAGEMENT
7720 Sheridan, Chicago 26,
Copyright 1958

(6) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Compartment "D"		
	Toll line jumpers	10
	Steel tape line – 200′	1
	Stencil kit	1
	First aid kit	1
	Slack gauge	2
	Extension telephone cord	1
	Safety goggles	4
In holder inside truck body		
	1 small cant hook	
In back of cab seat		
	Rubber gloves, with protector gloves and liners (in bags)	2 sets
In Racks on Truck Body		
	Pike poles	4
	Pole type tree saw	1
	Digging shovels	3
	Spoons	3
	Tamps	3
	Ladder, 24 or 28 ft. extension	1
	Frost bars	2
	TENDER TRUCK	
Compartment "A"		
	Insulators, exchange	15
	Brackets, oak pole	15
Bin #1	Insulators, toll	1
Bin #2	Insulators, toll	1
Bin #3	Insulators, toll	1
Bin #4	Insulators, toll	1

(7) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Bin #5	Insulators, toll	1
Bin #6	Insulators, toll	1
Bin #7	Pins, crossarm	4
Bin #8	Tie wires, #109 iron	25 lbs.
Bin #9	Test set, West	1
Bin #10	Tie wires, #104 copper	5 lbs.
Bin #11	Saw, docking	1
Drawer "B"		
Bin #1	Tube, 5/16″ x 3″ porcelain	10
Bin #2	Knobs "S"	15
Bin #3	Screws, angle	10
Bin #4	Screws, 3″ x #10 RH wood	15
Bin #5	Sleeves, T2-109D	30
Bin #6	Sleeves, 2-109D	100
Bin #7	Sleeves, T1-102 x 064D	35
Bin #8	Sleeves, 1-102D	100
Bin #9	Sleeves, 92-109D	50
Bin #10	Sleeves, 91-102D	50
Bin #11	Sleeves, 1-102x064D	30
Bin #12	Sleeves, T2-109x045D	40
Bin #13	Sleeves, 3045B	40
Bin #14	Sleeves, 3-064B	25
Bin #15	Sleeves, 2-091-D	25
Bin #16	Connectors for #6 ground wire	3
Bin #17	Nails, staple	1/4 lb.
Bin #18	Screws, 2″ x #18 FH wood	20
Bin #19	Sleeves, T2-109x064B	25
Bin #20	Screws, 2 1/″ x #18 FH wood	10
Bin #21	Screws, 2 1/2″ x #10 RH wood	30

PLANT MAN'S 'SPEC' BOOK

(8) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Bin #22	Screws, 2″ x #10 RH wood	40
Bin #23	Screws, 2″ x #14 RH wood	15
Bin #24	Hand tools	
Drawer "C"		
Bin #1	Protector Units	3
Bin 2#	Screws, 1/2″ x 4 1/2″ drive	12
Bin #3	Cobs, transposition	4
Bin #4	Clamps, Type B span	5
Bin #5	Clamps, 1-bolt	5
Bin #6	Spacers 3/4″ cable	11
Bin #7	Spacers, 1/2″ cable	6
Bin #8	Spacers, 1/4″ cable	11
Bin #9	Clamps, lashing wire	5
Bin #10	Screws, 3/8″ x 4″ drive	15
Bin #11	Washers, 1-1/4″ round, 9/16″ hole	30
Bin #12	Drive hooks	8
Bin #13	Nails, 50-D	1-1/2 lbs.
Bin #14	Nails, 30-D	1-1/2 lbs.
Bin #15	Clamps, Drop wire	25
Bin #16	Tape, friction	2
	Tape, Polyethylene	2
	Wire polishers, copper	25
	Wire polishers, steel	25
Bin #17	Screws, 1/4″ x 2″ drive	50
Bin #18	Nails, 6-D	1 lb.
Bin #19	Rings, 5/8″ bridle	30
Bin #20	Rings, 5/8″ drive	30
Bin #21	Rings, 1-1/4″ bridle	20
Bin #22	Clamps, span	20
Bin #23	Knobs, "C"	30
Bin #24	Rings, 1-5/8″ bridle	20

PLANT MAN'S 'SPEC' BOOK

(9) Materials and Tools for 2-Ton Line Construction and Tender Trucks

Drawer "D"		
Bin #1	Straps, #2 aerial cable	5
	Straps, #3 aerial cable	5
Bin #2	Straps, #1 aerial cable	5
	Straps, #4 aerial cable	5
Bin #3	Wire, cable lashing	5 coils
Bin #4	Brackets, deadend	30
Bin #5	Bolts, 3/8″ x 8″ carriage	10
Bin #6	Bolts, 3/8″ x 10″ carriage	10
Bin #7	Insulators, deadend	30
Bin #8	Butt block	1
	Plate and lag	1
	Detachable pole step	1
Bin #9	Anchors, assorted lead	40
Bin #10	Pins, deadend	30
Bin #11	Clamps, ground rod	6
Bin #12	Empty	
Bin #13	Bolts, 3/8″ x 6″ carriage	10
Compartment "E"		
	Blocks, slack	4
	Jumpers, toll	4
	Wire, bridle (all sizes)	25 ft. ea.
	Lineman's belt and climbers	2
	Axe, hand	1
Carried On Overhead Tool Rack		
	Ladder, 24 ft. extension	1
	Ladder, 10 ft. single	1
	Blade type free trimmer	1
	Tamp	1
	Shovel, digging	1

PLANT MAN'S 'SPEC' BOOK

(1) Ground Resistance Test Set for Testing Grounds

General

GROUND RESISTANCE sets are especially valuable for locating defective grounds in telephone plant, particularly in periodic checks under a planned maintenance program.

A program of checking central office and outside plant grounds on an annual basis is important to detect open or high resistance grounds which might cause failure of telephone protective equipment in these locations with resulting damage to plant apparatus, cable and central office equipment. This protective equipment operates when a power wire comes in contact with a telephone line or a lightning stroke induces a high voltage charge in the line. A good low-resistance ground will effectively disperse the lightning discharge or cause rapid operation of the power system overload protection, thus promptly removing the dangerous power voltage from the telephone lines involved.

Grounds at the following locations should be regularly tested:

1. Central offices, particularly those that are of the manual or unattended dial office type.
2. Line protectors or protected terminals at junctions of open wire and cable when it is company practice to place a buried ground at these points.
3. Buffer protection points.
4. High-voltage type protectors in open-wire joint construction.
5. Underground railroad crossings of telephone lines.
6. Pole mounted repeating and drainage coils.

from summer to January-February. In addition, an expected increase in wage rates of 5% is to go into effect at June 30; an additional man is to be hired at the same date, at the average wage rate. Much maintenance work is deferred to after June in order to utilize the new man's hours fully. No change was made in the original vacation schedule.

EDITOR'S NOTE

"Accounting Notes," by Dr. Gardner M. Jones, will appear in each issue of TE&M. If you have accounting questions, address them to Doctor Jones, care of TE&M.

In addition to showing the cost of manpower, department budget summary worksheets should provide also for the other expenses which are necessary for departmental operations. Materials requirements are constructed from experience, in the manner indicated earlier in this paper, related to the expected volumes of installation and repair activities, and so on. Vehicle charges are based on past experience related to expected volume, as are supplies estimates. *Table Five* is a very abbreviated illustration of a budget summary for a single department.

Budgeting Allocated Charges

OBSERVE that, up to this point, the departmental budget includes no allocated charges, i.e., charges distributed to it from any other department on a pro-rata basis. This is reasonable, because a supervisor can be considered responsible only for those expenditures over which he has control. The ultimate accounting disposition of the costs of plant supervision, as required for regulatory reporting purposes, has little or no relevance in planning and controlling expenditure. The point where the expenditure occurs is the critical point.

However, if it is desired to make budget estimates conform to the final form of accounting records, allocated charges *may* be incorporated in the departmental budget by securing from each service department (payroll, personnel, general office, motor pool office, etc.) an estimate of the amount of costs which they expect to allocate to your department for the coming period.

The schedule for budgeting must consider the lead time for these service departments to prepare their budgets and arrive at the probable distributions they will make of charges to other departments. *Table Six* shows a budget summary for the same department as *Table Five*, but with allocated charges included. The form has been recast to separate the budget summary into three categories: (1) labor, (2) expenses controllable at the departmental level, and (3) allocated expenses which are not controllable at the departmental level.

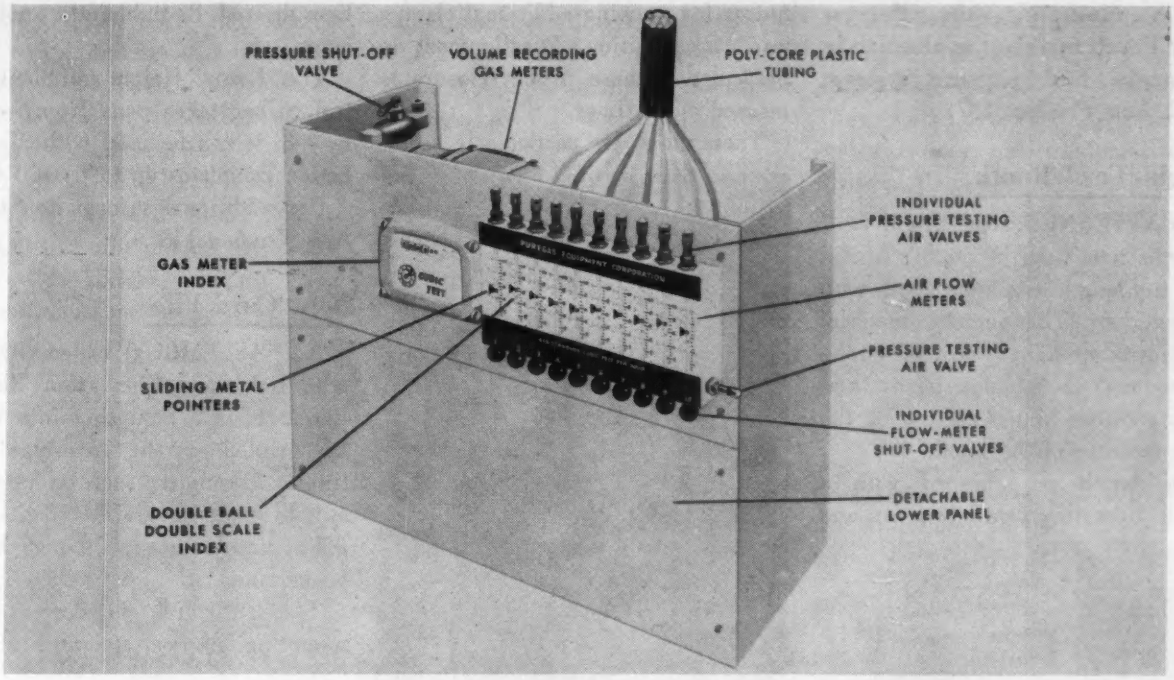
In the next issue, Doctor Jones will explain: (1) *how to budget in non-measured output areas;* (2) *preparation of the overall budget; and* (3) *following up the budget to make sure all elements are going according to plan.*

TABLE FIVE
Departmental Budget Summary, 1959, Dept. SI&R

Item	J	F	M	A	M	J	J	A	S	O	N	D	Total
Labor	1,911	1,794	2,006	1,964	1,994	2,009	2,426	2,438	2,583	2,492	2,392	2,392	26,401
Materials	980	964	900	840	950	850	1,140	830	880	1,080	940	930	11,284
Supplies	212	180	224	180	220	200	260	262	230	240	210	210	2,628
Tool Expense	40	35	40	30	40	40	42	44	48	46	44	42	491
Veh. Charges	164	170	196	205	220	210	224	224	208	212	200	220	2,453
Others	38	60	64	60	60	80	96	90	80	85	80	80	873
Total	3,345	3,203	3,430	3,279	3,484	3,389	4,188	3,888	4,029	4,155	3,866	3,874	44,130

TABLE SIX
Departmental Budget Summary, including allocated expenses, 1959 Dept,. SI&R

Acct. #	J	F	M	A	M	J	J	A	S	O	N	D	Total
Labor:													
Dep't employes	1,911	1,794	2,006										
Expenses controllable at department:													
Materials	980												
Supplies	212												
Tool expense	40												
Veh. charges	164												
Other	38												
	1,434												
Allocated charges:													
Garage	132												
Gen. office	460												
House Exp.	84												
Personnel	36												
Payroll	62												
Plant Engr.	80												
Plant Superv.	230												
Stores	100												
Treas.	—												
	1,206												
Totals	4,551												



Puregas Meter Panels For Continuous Feed Pressure Systems.

NEW PRODUCTS' SHOWCASE

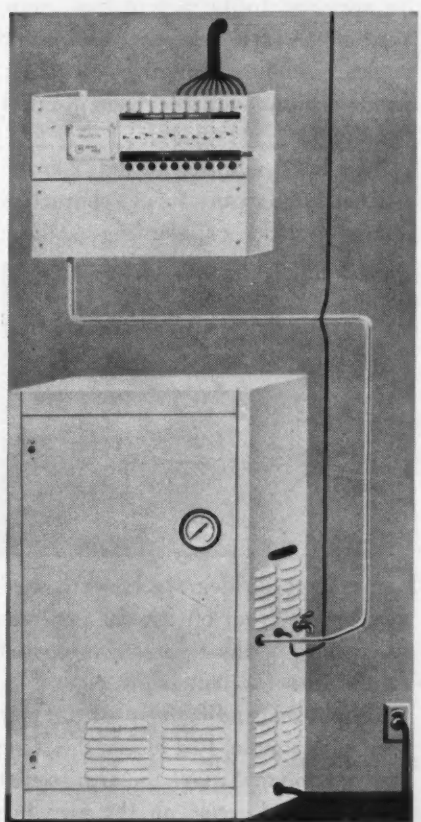
By DICK REYNOLDS

Puregas Meter Panel

PUREGAS Equipment Corp. has announced development of a new packaged meter panel to measure and distribute flow of dry air or gas from a continuous pressure source to telephone cables requiring pressurization.

The new meter panel is designed around two standard metering devices; the volume recording gas meter and individual air rate flow indicators. These instruments are incorporated on an attractive baked enamel cabinet only 19 inches wide x 8 inches deep x 14 inches high that is adaptable for mounting either on a wall or on a standard 19 inch relay rack frame.

Factory assembled, including fittings and tubing interconnecting pressure shut-off valve, gas meter and air flow indicators, the meter panels are simple to install requiring only connections from the pressure source and individual cables for operation.



Typical Installation of Puregas Model 500 Air Dryer with Meter Panel in a small exchange.

Available with 3, 5 or 10 air rate flow indicators per panel and engineered for vertical and horizontal stacking of additional panels as needed, the Puregas Meter Panel offers versatility in meter panel arrangements to handle requirements of the smallest exchanges to the largest central offices.

Other features include, air rate flow indicators that read up to 10 cubic ft. per hour, a double scale index for monitoring a much wider range of flow rates, numbered indicators to facilitate cable identity, sliding friction pointers to indicate excessive air leakage from cables that require maintenance, air valves for pressure testing and a detachable lower panel for providing access to fittings.

The illustration at left shows how these panels are installed when used in conjunction with a Model 500 Puregas Refrigerator Compressor Air Dryer.

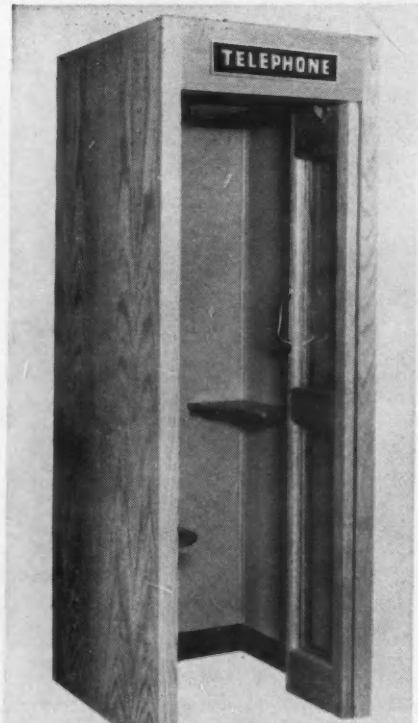
For complete information and lit-

erature illustrating the Puregas Meter Panels and their application in continuous feed pressure systems, *Check New Product* 137.

"Rigid-Tex" Booth

A PATTERNED, steel "Rigid-Tex" lining is now used in Suttle's Model A-10 full length telephone booth with folding door. This interior material is designed to take years of public punishment. Solid oak walls and heavy stainless hinges are among the other features of the booth.

The booth is equipped with a quietly operating ventilating fan and



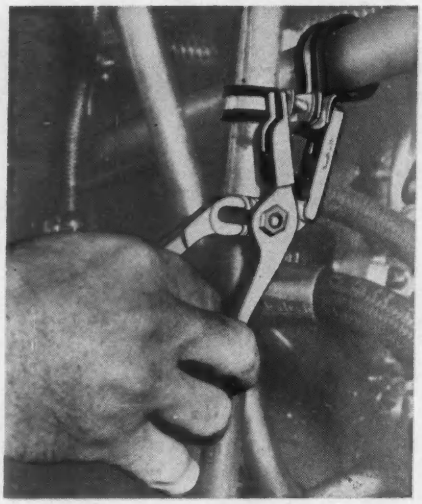
light automatically operated by the movement of the hinged two-piece folding door. The black-laquered brass "Telephone" sign is standard equipment — seat and pay station mounting shelf are also of solid oak for maximum life. For additional information, *Check New Product* 138.

New Hand Tool

PRODUCTION of a new hand tool that cuts clamp installation time up to 50% has been announced by TA Mfg. Corp.

The tool is a new kind of a plier that secures bolt, while clamp is mechanically closed and locked in place. This frees both hands for attaching nut or for stacking additional clamps into lock position. Misalignment is prevented because proper closure is insured at all times.

These pliers are particularly useful



in cramped quarters when space restricts the use of both hands. They are made of high quality forged steel. At present time the pliers are limited to the standard No. 8 or No. 10 size bolts. For further information, *Check New Product* 139.

Height-Slant Control Scriber

A NEW "Leroy" Scriber that can be adjusted to form template characters of varying heights and slant angles without changing character width is now available from Keuffel & Esser Co.

This latest addition to the "Leroy" Scriber line can form characters either vertical or slanting at any

angle up to 45 degrees forward, and any height from 60 to 150 per cent of the size of the figures represented on the drawing template used.

Height-slant adjustment of the new scriber is simple. Just loosen the large center knob and move the arm so that the small red circle on the arm lies directly under the intersection of the "degree slope" and "per cent height" lines desired. Re-tighten the knob and letter.

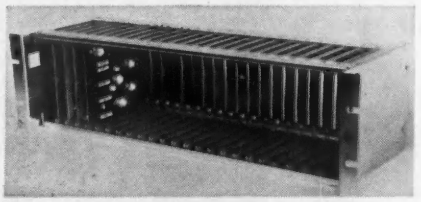
The "Leroy" Height and Slant Control Sriber takes pens from —0000 to —8. It can be used with "Leroy" Letter Templates up to — 500 C.

For additional information *Check New Product* 140.

New Card File

AN ASSEMBLY called Ransom type R-1 Card File, from Ransom Research, is a mounting into which 24 printed circuit card-type electronic assemblies, such as used for switching of telephone circuits, signaling and for use in computers, may be mounted.

The card file is designed for mounting into a standard 19-inch



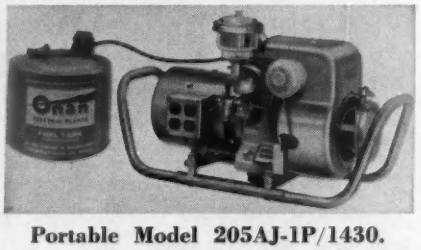
rack and is available with a type of connector specified by the purchaser. It is available in two basic types, one for removal of plug-in elements from the front, the other from rear.

Ransom Research also develops and builds transistor circuit devices to order. For further information, *Check NP* 141.

Portable Electric Plants

A NEW lightweight 2500-watt electric generating plant has been designed for a dual role . . . portable and/or emergency standby . . . by D. W. Onan & Sons Inc.

Weighing 140 pounds, this gasoline engine-driven generator set is

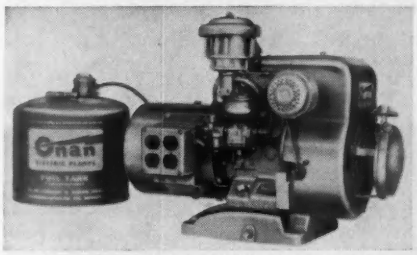


Portable Model 205AJ-1P/1430.

used as a heavy-duty power plant on a construction site or as a source of standby power for a home, business or small institution. Completely self-contained, the unit will provide full-

rated A. C. power to run electric tools, lights and motors for contractors . . . as well as operate essential household electrical equipment during emergencies.

Both Model 205AJ-1P/1430 (contractors model) and Model 205AJ-1M/1430 (standby model) are identical in weight and size with exception that contractors unit is equipped with aluminum carrying frame, making overall dimensions (approx. 24″ long,



Standby Model 205AJ-1M/1430.

15½″ wide and 19″ high) slightly larger. Each of the two new electric plants is equipped with a separate 5-gallon fuel tank with rain-tight cap.

Both portable and standby models deliver same type of A. C. electric power . . . either straight 115-volt, straight 230-volt or combination 115/230-volt current.

For further information, *Check New Product* 142.

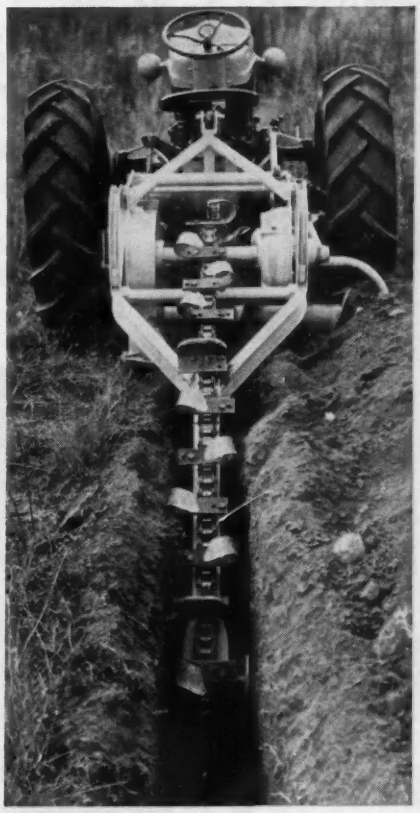
New "Laster" Trencher

DELTEC, INC., has announced production of a trencher that will overcome one of the chief drawbacks faced by the operator who can't afford to tie up his tractor with a single function.

The new trencher, which is called the "Laster" Trencher, can quickly be detached to free tractor for power tilling, grading, plowing or any of the many other jobs usually accomplished with a single tractor. Does not interfere with front-mounted equipment.

Any wheel type tractor, with a live power take-off, ASAE Standard 3-point hitch, can be equipped to operate the Laster trencher. An "Incher" device moves tractor forward at correct rate of speed to allow adjustable high carbon, abrasion resistant steel cutters to dig from 6″ to 14″ wide trenches.

Moving along at speeds up to 500 feet per hour under ample power of tractor, machine digs a clean trench to a maximum of 4′ in depth with standard equipment. Boom extension is available for deeper trenching.

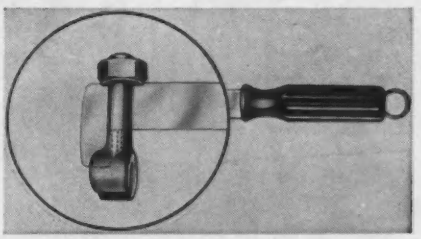


Soil is neatly conveyed to right of cut with a screw type earth mover. It weighs approximately 700 pounds. *Check New Product* 143.

New Skinning Knife

A SKINNING knife to cut, peel, and strip off neoprene and polyethelene coatings from wire and cable has been announced by Miller Equipment Co., Inc. Designed to handle equally efficiently aluminum conductors 2/0 to 4/0 flat service wire.

The knives are adjustable to avoid cutting and nicking of wire, and reduce skinning time by 80 to 90%. They work equally well for both center splices and conductor ends. Knife blade is completely shielded to protect hands. After splitting insula-

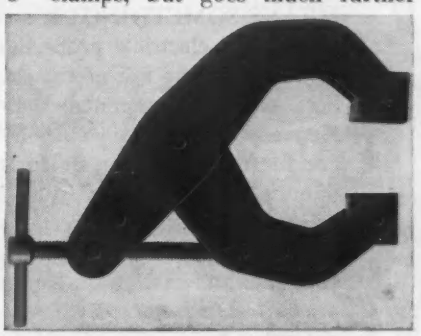


tion, outside guide will slip under insulation and peel or roll off material with a twist of the wrist.

It is known as the No. 74 Polyknife, but can also be used as a regular skinning knife. For further information, *Check New Product* 144.

Kant-Twist Clamp

SAXTON MANUFACTURING Co., has announced a new clamp with a 4½-inch deep-throat. Designated the Kant-Twist Clamp it comes in the well-known line between the 3″ and 6″ clamps, but goes much further



with its deep throat that has a reach of approximately 3″. *Check New Product* 145.

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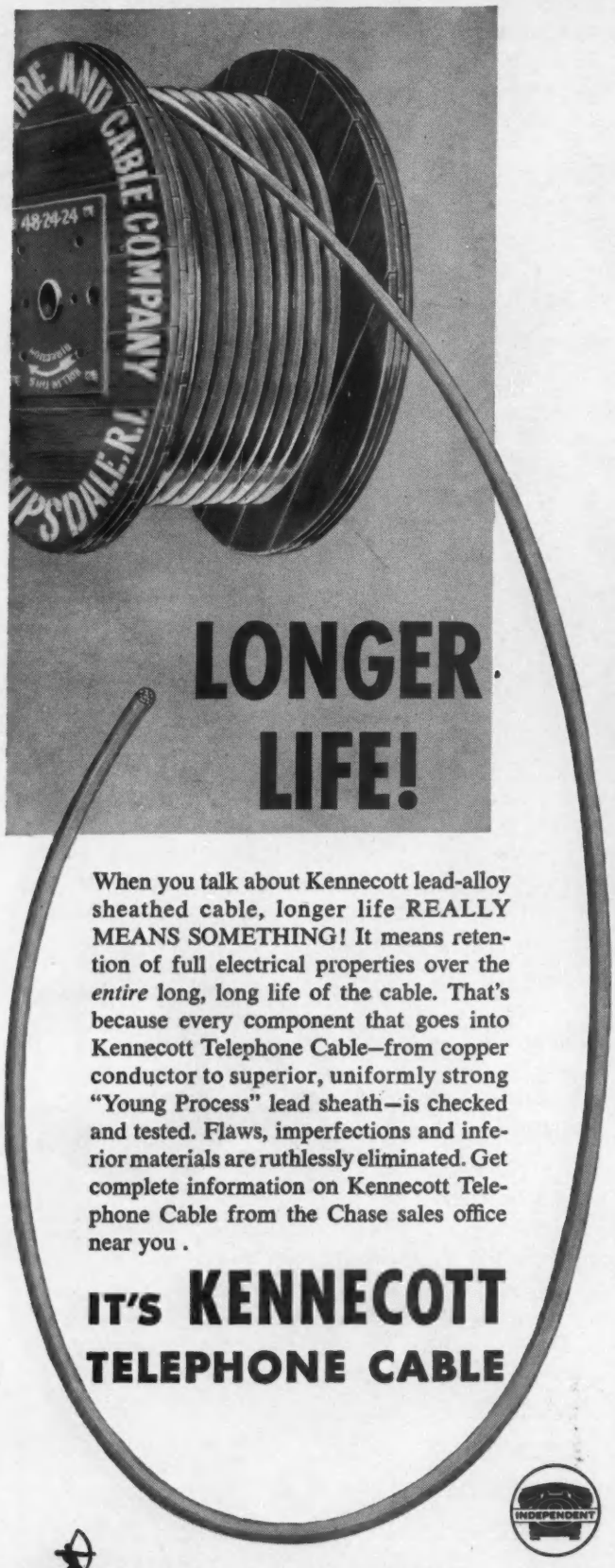

When you talk about Kennecott lead-alloy sheathed cable, longer life REALLY MEANS SOMETHING! It means retention of full electrical properties over the *entire* long, long life of the cable. That's because every component that goes into Kennecott Telephone Cable—from copper conductor to superior, uniformly strong "Young Process" lead sheath—is checked and tested. Flaws, imperfections and inferior materials are ruthlessly eliminated. Get complete information on Kennecott Telephone Cable from the Chase sales office near you.

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"Easy Does It"

(Continued from page 40)

drop wire slung over his shoulder, entered the jewelry store in a gust of snow saying:

"You gotta clock around here that needs fixin'?"

The jeweler-watch repairman, snorting with impatience as he watched the lineman stamp the snow off of his pole-hiker boots and climbers, replied in surpise:

"Yes, but it isn't up at the top of any pole."

Over and above the humor of the incident, the story is a good example of the wide range of talents and skills that are needed in many communication jobs. In a similar way, the telephone plantman who, in the morning, replaces a pole split by a stroke of lightning and, in the afternoon, cleans and adjusts the speed of a telephone dial is exercising the same versatility.

The author, T. DeWITT TALMAGE

Service Outages vs. Impairments

MOREOVER, there is a subtle implication and truth, none the less important, that can be read into these two examples of communication work just mentioned, namely, a telephone service *outage* — a complete interruption or failure — is one thing but a service *impairment* is another. At times it seems that the former condition is the better understood one of the two — perhaps because it is more obvious. However, the recognition, detection, and correction of the latter condition of subnormal service is growing more vital with each passing year.

The clue to what is being discussed now is contained in the clock repair story just related. That is, for satisfactory time service, a clock must not only run continuously, *but it must run on time.* To further illustrate this contrasting situation the following examples are included to demonstrate the application of standards in some typical telephone plant situations:

(1) The telephone dial must not only rotate smoothly, but it must do so within certain minimum and maximum

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Price dial blank $10.50
As is working order;
Price with dial $10.50
Price dial blank ..... $ 8.50

LEICH 901 MAGNETO DESK OR WALL Late type instruments with 1600 ohm ringers & strong generator for those long rural lines. Can convert to C.B. or dial.

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speed limits — usually stated in impulses per second.

(2) The A-C ringing power supply of a telephone central office must not only be constantly available but its output voltage must be right for its intended purpose and its frequency in cycles per second must be held within specified tolerances set by the characteristics of the ringing load. This latter condition is shown being checked in *Figure Five.*

(3) Then again, especially in certain electronic devices and systems, the correct adjustment of variable elements and controllable components is as important to prevent impairment or degradation of telephone service as out-and-out repair work that is required to re-establish operation after a service outage.

The industry appreciates the importance of fast restoration of communication service after an interruption. But in too many companies there is a lesser degree of appreciation of the necessity to consistently furnish the high quality of communication service that equipment is perfectly capable of delivering. Often this is due to lack of suitable test equipment that permits a maintenance man to conveniently check and evaluate the performance of the system.

Low Cost, Precise Results

SIMPLE calculations, using only elementary arithmetic, will help one to prove to himself the dollar and "sense" importance of the generally known but frequently overlooked fact that skilled man-hours are entirely too valuable — to precious, if you please — and in far too short of supply to squander them in the leisurely, outmoded, uneconomic system of substituting expensive time for the lesser annual carrying charges[7] on time-saving tools and test equipment.

The use of labor-saving tools and labor-saving test equipment is necessary to secure minimum costs as well as secure the *precise results* required today that less accurate and less efficient methods just don't furnish.

In many areas of telephone plant work, standardized and specialized tools, *and the accompanying knowledge and skills required to apply and use them to best advantage,* are indispensable to maintaining telephone service quality up to the level of present day commercial standards as well as holding costs in line.

In this respect, every telephone worker has an obligation to continually revaluate his work for the purpose of obtaining the best possible results with available man power, materials, tools, and funds. Of equal concern and importance should be the identification of those areas where efficiency could be improved and, consequently, unit costs lowered by making changes in current methods, materials, and tools.

No Problem Too Small

NO PROBLEM is too small to consider if it gives hope of reducing costs. For example, in the cleaning of central office buildings, it might appear that any attempt to use lower-cost methods would only lower standards of cleanliness to questionable, if not objectionable, levels.

Cleaning and maintaining buildings is always a tempting target for those who have little or no qualms about skimping, regardless of consequences. However, in certain sections of central office buildings, for instance, in the space housing telephone equipment, such skimping may pose serious problems unless good judgement is exercised. The reason for this is that over-simplification of cost reduction in this area might end up in less cleaning than ever being done, with all of its attendant effects — none of which ever seem to turn out to be good.

Periodically, well-informed telephone men remind our industry not to ignore the part that central office building housekeeping and maintenance play in the overall performance of a telephone system. If these operations are improperly handled, the resulting unsatisfactory conditions will adversely affect fire hazards, accident possibilities, insurance rates, employes' health, life of telephone equipment, quality of telephone service, cost of equipment maintenance, and so on.

Only a short time ago, the president of one of the progressive state telephone associations devoted considerable time in a convention address to explain the possibilities of substantial improvements in this often slighted, but none the less important, area of telephone operating work.

More recently, in the annual shareowners' meeting of the American Telephone and Telegraph Company, Mr. Frederick R. Kappel, president, included in his report mention of his company's success in its continuing war on dirt and reducing its cost of removal. Mr. Kappel stated that the Bell Telephone System was saving one million dollars per year simply through using a new treated cloth in the dustless sweeping of building floors.

The significance of rapid and thorough sweeping and dusting can't be minimized because half or more of all cleaning time is devoted to these two operations.

One such widely used system, based on dust and dirt actually being *removed* from premises rather than being stirred into the air and redeposited on some other surface, is furnished on a *rental* basis. No investment or deposit is required of the user in this case. [8, 9]

A country-wide survey indicates that 90 cents out of every dollar spent for cleaning and maintaining buildings goes to pay for labor. To get the most constructive results out of that 90 cents, the remaining 10 cents of the "cleaning dollar" should be invested — or

---

[7] *"Annual charges" are the expenses which arise from the ownership and operation of plant facilities, including test equipment, and recur yearly as long as the plant remains in service.*

[8] *See "A New Technique in Sweeping and Dusting," by R. C. Bacher, Buildings — The Magazine of Building Management, Vol.* 54, *No.* 11, *November,* 1954, *pp.* 24 *and* 25.

[9] *For the address of the nearest regional office and complete details of one such nation-wide, rental dust control system see the classified section of telephone directories under "Wiping Cloths," or write to "Kex" National Service,* 295 *Fifth Avenue, New York* 16, *New York.*

put into the cost of renting — the best cleaning tools and supplies that can be had. It follows, then, that the first step toward getting 90 cents worth of acceptable cleaning results in return for 90 cents of pay is to provide modern, correct, and long-lived building cleaning equipment.

Thus, by carefully choosing cleaning equipment and cleaning materials to do the best job, the *overall* cost of the work can be held to the minimum consistent with reasonable standards of cleanliness and sanitation. In many instances, for equivalent results, a net savings can be obtained. In still other instances, *better* results can be gotten and a net savings still can be had!

Calculating Your Net Gains

TO BE MORE specific, the use of improved cleaning methods and materials will permit the typical telephone company to do better than the prevailing nation-wide simple average (arithmetical mean). To accomplish this, a company will generally need to study the revision of its cleaning practices to the end that the resulting ratio of its cost of labor to materials is in the most favorable proportions.

To better understand this point, let's take an *average* case for illustration and assume that up-to-date cleaning equipment and supplies, properly chosen and fitted to the job, cost one percent more than the usual or ordinary cleaning tools and materials. Furthermore, let's conservatively assume that the intelligent application and use of these improved, better-fitted items result in reducing the amount of time required to do a satisfactory job by the same percentage: one percent.

What has been the net gain?

A skeptical, busy person — with many things on his mind — might be tempted to impulsively ask, "How can anyone possibly make a profit by trading a one percent increased expenditure for a one percent decreased expenditure?"

A workmanlike analysis of this cost-reduction problem clearly indicates that the trade is *not* an even swapping of dollars as might seem to be the case at first glance. Quite the contrary. It is definitely a step in the right direction of lower costs.

How is this gain determined?

Simply by remembering that the all-important starting point or base on which the percentage is figured in this example is the 9-to-1 national cost ratio involved in the average case. The correct and interesting answer is then obtained by the use of simple arithmetical principles, usually taught in junior high school, namely, (1) the multiplication of the decimal form of percents and, (2) the subtraction of the two products obtained in step (1). This results in determining that there is a *net savings* in this case of eight-tenths of one percent. Consequently, the newly established labor-to-material cost ratio is 8.82-to-1.

In actual practice, this savings will probably be larger, depending upon the facts found in each particular situation. For instance, the outcome of some studies may even show a decrease in *both* material and labor costs — with improved results, to boot. However, in degree, no two cases, can be expected to be alike.

The main reason for detailing the foregoing example is to more emphatically illustrate that the same basic method of investigation, analysis, and cost comparison is applicable when searching for the most favorable economic balance between any or all of the factors entering into a host of other problems.

The use of this businesslike approach, *with due regard for standards geared to things as they are, not as they were,* will assist one in arriving at the lowest practical cost determinations, needed to guide an economical course of action.

SUBMIT YOUR PROBLEMS

You are invited . . . to tell our authors about problems on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in TE&M's regular departmental columns . . . and that could be helpful to you and others with the same (or equal) problem.

The Editors.

It was systematic studies like those discussed in this article that hastened the development of a variety of time-saving telephone plant and equipment testing devices. For example, the largest single source of outside plant troubles in many companies is line insulation faults. There is now available a line insulation routine tester — automatic in operation — which checks and *records* the insulation condition of local exchange lines. This automatic line insulation routiner makes three separate electrical tests (one each for crosses, shorts, and grounds) on each subscriber's circuit in one tenth to one twenty-fifth of the time it can be done on a manual basis.

Other practical examples of labor-saving ideas can be found described in recent communication trade and technical literature as well as in the latest catalogs and descriptive brochures issued by telephone manufacturers and suppliers.

Where To Find A Helping Hand

IN CONCLUSION: (1) Most savings do not happen accidently — they are planned. (2) It is difficult nowadays to start anything worth while without the use of a pencil. Furthermore, closely coupled with factual statement (2) — just as ham and eggs naturally go together — goes another thought worth considering (3): "The best place to find a helping hand is right at the end of your own arm." Statement (3), although a proverb, is a practical one, and is especially true, of course, if your hand is holding the right end of that sharp pencil mentioned in statement (2). Under such conditions, the common pencil becomes as valuable a tool as any other in the plantman's kit of tools — and just as productive, if not more so.

The better you are able to schedule and coordinate adequate time to make alternate cost studies, alternate cost estimates, and comparative cost analyses, the better will be the fiscal results as reflected in the year-end report of operations. Those who follow these rewarding policies, recommend them highly.—*T. DeWitt Talmage.*

GEORGE B. COCKE, president, Central Mutual Tel. Co., Manassas, Va., in company's Museum of ancient telephones and switchboards used at different times over the 41-year span of the company.

Officers and Directors of Central Mutual Tel. Co. Seated (L-R) HARRY P. DAVIS, treasurer; MRS. RUTH HOOFF, director; GEORGE B. COCKE, president; MRS. MARJORIE SCOTT, director; MRS. SARA VETTER LUCK, secretary. Standing (L-R) FLOYD VETTER, general manager; C. LACEY COMPTON, vice president; WOODROW VETTER, personnel manager.

MRS. HELEN FOX, chief operator, has slight lump in her throat as she pulls down last cords at darkened manual board.

Carrying forward the program set in motion by their father (the late J. A. Vetter) are FLOYD VETTER (left), general manager, and WOODROW VETTER, personnel manager, in doorway of new building.

Progress Story

From Manassas, Va.

By GEORGE B. FORBES

EVERY SCHOOLBOY has heard of the Battle of Bull Run. Some will remember that this bloody conflict in the War Between the States took place in Manassas. This vignette on the page of history will be re-enacted in colorful pageantry during the Centennial year, with Manassas citizens taking the leading roles. But in 1958, these citizens had something else on their minds . . . Manassas as a leader in bringing people together. The story begins with a young man — seriously ill.

"THERE MUST be a way! My husband has pneumonia; I need to know how he is."

Martha Nash Cocke should have known better. She grew up in Manassas, and like everyone else there, knew that the telephone switchboard closed at night and on Sundays. But this was an emergency — her young husband lay seriously ill over in Petersburg. Had he improved during the day? . . . did he need her? . . . why couldn't she get a message through — take those clutching fingers from her throat? How interminably long that night seemed!

George Cocke saw it a little differently. His business, once on his feet again, was keeping other people well; calls to his drug store should not be restricted to the daylight hours. He found everyone ready to listen when he talked better telephone service; some were ready to join him in action.

It was 1925. At a table in "Doc" Cocke's home were Mr. J. A. Vetter, father of the Vetter brothers and Sara Vetter (Luck) who now are managing the telephone company; Mayor Harry P. Davis, now treasurer of the company; Mr. A. A. Hooff, whose

Their part expertly finished: (l-r) Installers WILLIAM COFFMAN; DURWARD KINSLER; DEWAYNE WHITE; J. T. CLARK, foreman; GEORGE WOOD; G. B. WRIGHT, toll ticketing field engineer; GEORGE H. CHRISTIANSEN, chief installer for Stromberg-Carlson.

wife is on the present board; several others whose common interest was to remedy the telephone situation. At this meeting the present Central Mutual Telephone Company was born.

From here on in there was no one principal character: all were cast in supporting roles. Mr. Vetter knew the workings — and the problems — of telephone operation. As his sons grew to manhood he taught them well, so that they stepped out in his shoes when he was denied seeing the completion of his dream. "Doc" Cocke undertook the job of master planning and the always difficult task of maintaining good public relations during the interim period before final plans can be realized. Mr. Davis and Judge Lacey Compton worked on the finances and certain legal matters so that the company could retain its local character.

Manassas — A Leader In Providing DDD

What lifts this story out of the ordinary?

Was it the unusual "inspiration" that triggered progress? It's a known fact that many Independents were started to provide needed service for doctors (or undertakers).

Was it the financing? Certainly it takes nothing away from these men of Manassas, who over the years put all their dividends back into the business as a measure of their faith, to say that others have done this also.

Was it the dimension of their planning? They were not alone in investing personal funds to build magnificently — to accept their place in the community as pace-setter for civic improvement.

Perhaps one factor made this occasion different than all others. Manassas — known historically for its unsought part in the War of Separation — leads Virginia and most of the Southeast into the greatest movement for uniting people everywhere: nationwide direct distance dialing.

A charming lady who has seen many summers here summed it up simply.

"We like to talk with our friends wherever they are. I'm not sure I'll be able to make my own calls at first, but the telephone company will help me . . . they're so kind. And say, young man, don't you think it's wonderful that they've given me this service now — while I'm young enough to enjoy it "

"Doc" Cocke and *all* the Vetters would have felt rewarded by the merry twinkle in her eye. — *George Forbes.*

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Station Installation

(Concluded from page 42)

tact with inflammable or metal surfaces inside the building. If the wire entering the building would have to be run in closed ceilings, it is advisable to install an outside type protector, if practicable, so that bridle or outside-inside wire can be placed inside the ceiling space.

The drop wire run should be installed in "C" knobs (or insulated screw eyes for more than 2 wires) spaced 16 inches apart.

If the run between the entrance and the inside protector crosses or parallels pipes or electrical wiring, it should be kept adequately separated from these objects or properly protected. Where "C" knobs will not hold the wire run away from contact with wood or metal, a section of "P" drop wire guard may be placed on the wire at the point of contact. This plastic guard, however, should not be used in contact with bare steam pipes or neon sign wiring. A porcelain tube may be used to protect the drop wire from contact with a steam pipe.

Requirements for Station Protection

TELEPHONE lines in aerial construction (open-wire, rural distribution wire, or drop wire, or drop cable from cable terminals) are subject to the hazards of lightning, accidental contacts with power and street lighting circuits (over 300 volts), and induced currents from unbalanced power lines. Such exposed telephone lines should be provided with station protectors installed on the subscribers' premises.

Telephone lines that are completely in underground cable are considered to be safe from these hazards and station protection would not be required on these lines. On the other hand, lines completely in aerial cable or partly in underground cable and partly in aerial cable are classified as "exposed" if any portion of the aerial section is in joint construction with power lines. These lines then require station protection, unless the entrance cable terminates in a building type protected terminal.

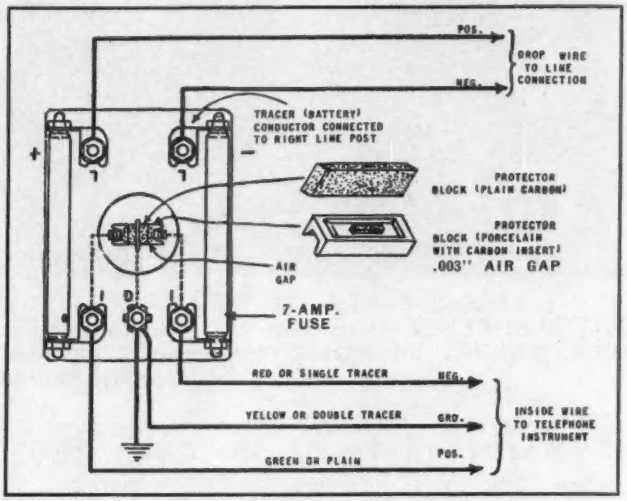

FIG. 26: — Diagram of wiring connections for station protector.

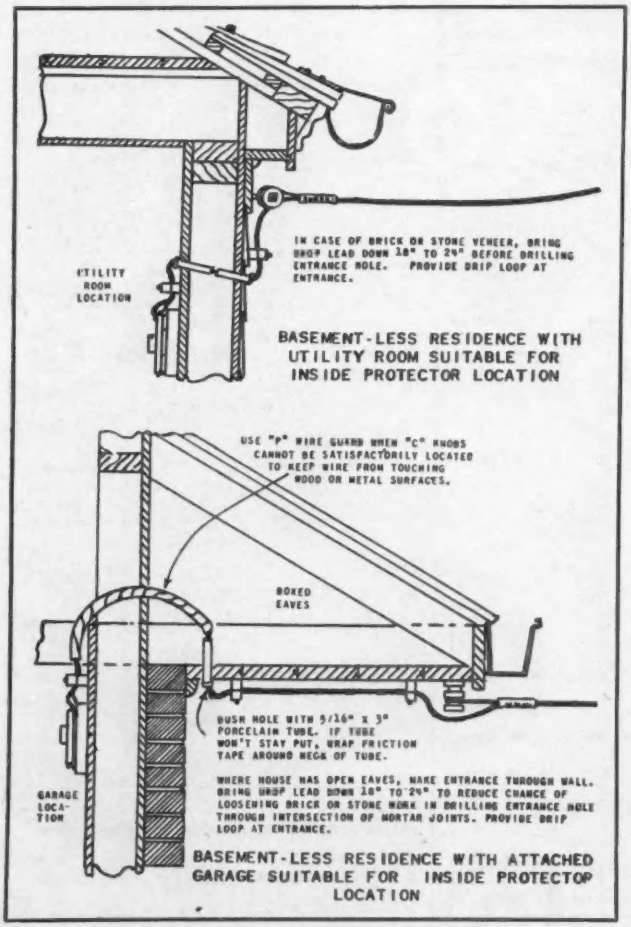
UTILITY ROOM LOCATION
IN CASE OF BRICK OR STONE VENEER, BRING DROP LEAD DOWN 18" TO 24" BEFORE DRILLING ENTRANCE HOLE. PROVIDE DRIP LOOP AT ENTRANCE.
BASEMENT-LESS RESIDENCE WITH UTILITY ROOM SUITABLE FOR INSIDE PROTECTOR LOCATION
USE "P" WIRE GUARD WHEN "C" KNOBS CANNOT BE SATISFACTORILY LOCATED TO KEEP WIRE FROM TOUCHING WOOD OR METAL SURFACES.
BOXED EAVES
BUSH HOLE WITH 5/16" x 3" PORCELAIN TUBE. IF TUBE WON'T STAY PUT, WRAP FRICTION TAPE AROUND NECK OF TUBE.
WHERE HOUSE HAS OPEN EAVES, MAKE ENTRANCE THROUGH WALL. BRING DROP LEAD DOWN 18" TO 24" TO REDUCE CHANCE OF LOOSENING BRICK OR STONE WORK IN DRILLING ENTRANCE HOLE THROUGH INTERSECTION OF MORTAR JOINTS. PROVIDE DRIP LOOP AT ENTRANCE.
GARAGE LOCATION
BASEMENT-LESS RESIDENCE WITH ATTACHED GARAGE SUITABLE FOR INSIDE PROTECTOR LOCATION

FIG. 25: — Methods of bringing drop wire into buildings without basement.

The fused type station protectors are equipped with 7-ampere fuses and protector blocks having .003 inch air gap. *Figure* 26 illustrates the schematic of a typical station protector. A high voltage on the line will discharge to ground through the air gap between the protector blocks, preventing damage to the station equipment and wiring. A high current from severe lightning or power line contact will blow the fuses and thus open the circuit to the station equipment and wiring.

Uses of Inside and Outside Types of Protectors

TWO GENERAL types of protectors are used in station protection, one designed for outdoor use and the other for indoor locations.

The inside type protector is intended for location in unfinished rooms, such as the basement (not basement

apartment) of a building, or the utility room or attached garage of a basement-less residence. No attempt should be made to run drop wire through an enclosed ceiling or wall space in the basement in order to place an inside protector. It is preferable to install an outside protector so that bridle or "outside-inside" wire can be placed through the enclosed space.

The outside type protector is recommended for all buildings in unattended dial exchanges, regardless of class of service provided (business, farm, or town residence) and the type of building construction used. In other places, the installation of an outside protector is recommended at the following locations:

(1) On buildings subjected to periodic flooding or having a permanently damp or excessively dirty or crowded basement where space for mounting an inside type protector is not available or would require a long drop wire run inside the building.

(2) On buildings where a dangerous fire hazard, such as explosive gas, vapors, or dust-filled atmosphere is present. Paint shops and grain elevators are examples of such hazardous locations.

(3) At filling stations, contractor's shanties, and the like where a pay station is installed, and the customer might tamper with an inside protector located in the same room with the pay station.

(4) At a residence with finished basement (basement apartment) and no attached garage, utility room, or unfinished basement room suitably located for placing an inside type protector.

(5) At a residence with no basement or only a crawl space, and no utility room or attached garage suitably located for mounting an inside type protector. — *To Be Continued.*

Technical Training Bulletins

AUTOMATIC Electric Company's training series bulletins number 802, *Fundamentals of Apparatus and Trunking;* number 203, *Distributing Frames;* and number 820, *Manual Switchboards,* have been revised for use of students in the company's training school. The bulletins are 8½" x 11" and are illustrated with photographs and schematic drawings.

To obtain your copy write *Walter Axelson, Automatic Electric Sales Corp., Dept. TE&M, Northlake, Ill.*

Bulletin For Attendants

A NEW attendant's instructions bulletin, number 412, prepared to instruct attendants in the proper operation of the type 33A6A P-A-B-X attendant's cabinets, has been released by Automatic Electric Co. The 16-page, 5" x 7" booklets, to be distributed to customer operators as the cabinets are installed, are designed to assist the operating companies in their never-ending measures to improve subscriber relations. Companies who have need for copies may obtain them by writing to *Walter Axelson, Automatic Electric Sales Corp., Dept. TE&M, Northlake, Illinois.*

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COURTS and COMMISSIONS

by JOHN G. REYNOLDS

States Move To Tighten Rate Controls

Texas considers creation of utilities commission . . . Tighter rate regulation recommended in Maryland and Delaware . . . New Hampshire bill would enlarge commission.

State Utility Controls Proposed By Texas Bill

- **Measure would create 3-man commission to regulate telephone, gas and electric companies.**

CREATION of a statewide public utilities commission to regulate telephone, gas and electric power companies was proposed by a bill introduced in the Texas legislature by Representatives Bill Kilgarlin and Clyde Miller, both of Houston.

The measure would establish a three-member commission to regulate rates and other services. Members would be appointed to six-year terms by the governor, with approval of the State Senate, and be paid $17,500 a year.

Baytown City Attorney George Chandler, who helped draft the proposal, noted that "every state except Texas and Iowa now has a public utilities commission. We believe that setting up a commission in Texas would bring lower utilities rates, particularly on intrastate telephone calls."

While the State Railroad Commission now reviews disputes between cities and natural gas companies, Chandler said "rates are now unregulated outside the cities and hardly regulated within cities."

The proposed legislation provides that commissioners must be college graduates, at least 25 years of age, and have experience in utility regulation. An exception is made for the first three commissioners in that they need not have a college degree if they have had at least 15 years' experience in utility regulation as an employe of an agency or municipality in Texas.

The commission could employ a chief legal counsel, a chief engineer and a chief auditor at maximum salaries of $15,000 a year, and other employes, including an examiner at $9,600. It would have the power to inspect utility corporation books on demand, and to require the filing of information and reports.

The commission would be financed by the utility companies by payment of a quarterly assessment of ¼% of their gross receipts for the preceding quarter. The state attorney general could file suit to collect delinquent payments.

To get the commission started, the bill provides for an initial appropriation of $50,000 from the general fund, which would be replaced when the first quarterly payments are made by the utilities.

The measure sets forth how a "rate base" shall be arrived at in evaluating the property and assets of utility companies for rate making purposes. Utilities would be required to furnish the commission a list showing the original cost of all properties, materials and equipment. They would furnish the amount of accumulated reserve set up for depreciation of such properties and equipment.

The commission would subtract from the total original cost a figure not less than 50% nor more than 75% of the reserve, for depreciation. The remainder would constitute the rate base.

Appeals could be taken from the commission to a District Court of Travis County. Violations of the act would subject a utility to civil penalties of $25 to $1,000 a day.

Oregon Telephone Rate Issue Taken to Court

- **West Coast Tel. charges order restricting increase in exchange rates to $259,543 annually.**

AN ORDER by the Oregon Public Utility Commissioner which limited exchange rate increases granted West Coast Telephone Co. to less than half the figure requested has been challenged by the company in a suit filed in Marion County Circuit Court.

The telephone company charged that the portion of the commission's order restricting the raise in exchange rates to $259,543 annually denied the firm a reasonable return on its investment in Oregon. It alleged that this, in turn, deprived the company of its property without due process of law, contrary to the federal constitution.

Citing a PUC conclusion that "by reason of the substandard service conditions and practices of record, the company's rate of return should be fixed in the lower ranges of the zone of reasonableness," the firm's complaint described this conclusion and the commission's findings as "erroneous, illogical and unlawful."

Early in 1958, the company applied to the commissioner for rate relief amounting to $834,000 annually. The commissioner granted a raise in yearly revenue of $440,000. The entire difference was reflected in the disallowance of requested exchange rate increases.

Tighter Rate Regulation Recommended In Maryland

- **Proposed legislation arrive at making it more difficult for utilities to obtain rate increases.**

BILLS which would make it more difficult for utilities to win rate increases were introduced in both branches of the Maryland legislature to carry out recommendations by an interim committee study of the State Public Service Commission. The proposed legislation would strengthen

the hand of the people's counsel in opposing fare and rate boosts.

In a report last fall, the interim committee compared the people's counsel in opposing fare and rate boosts.

In a report last fall, the interim committee compared the people's counsel to "David with a slingshot opposing a Goliath who has limitless funds to hire any available experts and legal weapons."

Oregon Commissioner Cuts Bell Rate Boost Request

- **Retiring Oregon Public Utilities Commissioner grants Pacific Telephone $759,000 of $4,858,000 rate request; applies own method of separations.**

IN HIS last major official action before leaving office, retiring Oregon Public Utility Commissioner Howard Morgan handed down a rate order granting the Pacific Telephone & Telegraph Co. $759,097 annually, instead of the $4,858,000 which had been sought by the company.

Commissioner Morgan, in the action, cut the company's intrastate rate base $10,000,000 by "transferring" most of it to interstate operations. He contended that "It has long been a source of outrage to many Oregonians that long distance tolls within the state are at least twice as high as toll charges for comparable distances across the state line in interstate commerce. There is no reason for this manifest injustice except the highly arbitrary procedures adopted by the Bell System for allocating their properties between interstate and intrastate commerce."

Separations witness for the commission in the rate case, in hearings held during September and December, was Curtis M. Bushnell, Washington public utilities consultant and former acting chief of the FCC Common Carrier Bureau.

Morgan said his ruling authorized a 6.35% return on the authorized rate base, and he declared the company had requested an 8.25% return.

In a statement, Pacific Telephone Vice President and General Manager F. A. Dresslar declared it is a "mat-

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ter of grave concern to us that the Commissioner has chosen to adopt untested theories not acceptable to any other state regulatory body in the field of separating interstate and intrastate plant investment. As a result, Pacific Telephone has been denied the right to earn any return on some $10,000,000 it has invested in plant serving Oregon telephone users."

North Carolina Phone Rates Given Approval

- **Adjustment reduces charges for about 85,000 subscribers and increase charges for some 325,000 customers.**

SOUTHERN BELL Telephone Company's recent proposals to adjust its North Carolina rates were approved by the State Utilities Commission, effective Feb. 1.

About 85,000 customers who live on the fringes of the firm's communities will be relieved of mileage tolls totaling $1,090,700, but $1,090,078 of this will be recouped by an increase in the phone bills of some 325,000 other customers.

The commission ordered Southern Bell to eliminate discriminations by extending base rate areas to bring in fringe area customers and permitted the company to recoup the revenue loss by regrouping certain exchanges into higher rate-paying classifications.

The case was retained on the commission docket to permit determination of the reasonableness of company profits at a later date.

Accounting Rule Change Proposed By AT&T

- **AT&T proposes change in definition of wire, cable retirement units.**

A PROPOSED amendment in the FCC accounting rules to provide that minimum lengths of aerial cable and aerial wire defined as retirement units in Part 31 may be increased from one span to two for cable and two spans to five for wire was proposed last month by American Telephone & Telegraph Co. Comptroller A. L. Stott.

The proposal is being made, Stott said, so that many small replacement jobs, part of current plant upkeep and now accounted for as construction and removals, may be accounted for as maintenance, with resulting considerable savings in accounting and other clerical effort.

The AT&T Comptroller said there are about 15,000 jobs in the Bell System annually which would fall into the category to be changed. They result from the fact that it is frequently more practical to replace a whole span of cable than to undertake mid-span repairs, and because more than two spans of aerial wire frequently must be replaced because of damage to wire at the tiewires in the adjoining spans. He estimated an increase in annual maintenance charges of about $1,500,000, but said that this would be partially offset by reduced clerical and other expenses, and that ultimately depreciation expense would tend to be reduced.

New Hampshire Bill Would Enlarge PUC

- **Bill, introduced by Rep. George A. Lavoie, would increase PUC membership from three to five.**

A BILL to increase the membership of the New Hampshire Public Utilities Commission from three to five is being sponsored in the state legislature by Rep. George A. Lavoie, Manchester Democrat.

If there were five members, he contended, the representation in the agency would be more "equalized" and probably more aware of the "true feelings" of the public.

His bill also asks that the term of the commissioners be reduced from six to five years. He contends this would "keep them on their toes."

Would Tighten Delaware Utility Rate Procedure

- **Bill would repeal part of state law which permits a utility to put a rate increase tentatively into effect under bond.**

A BILL introduced in the Delaware legislature by Rep. F. Earl McGinnes, Forest Brook Glen Democrat, would repeal a part of the present state law on public utilities which permits a utility to put a rate increase tentatively into effect, under bond, while the State Public Service Commission is studying and deciding on its application for the rate boost.

Present law provides that a utility seeking a rate increase can proceed, after 30 days, to charge the proposed rates, after posting bond to guarantee it will return to its customers any difference between those rates and the rates ultimately set by the PSC.

The legislative proposal by McGinnes would leave in the law a section that permits the PSC to suspend proposed rate increases up to six months, and would throw out two sections which permit the utility to furnish customers with evidence of their payment of the increased rates.

Illinois Commission OK's S. W. Bell Calling Plan

- **Plan will eliminate toll charges for calls between adjoining exchanges.**

THE ILLINOIS Commerce Commission has approved a plan of the Southwestern Bell Telephone Co., for its territory in Illinois, under which toll charges would be eliminated for calls between adjoining exchanges. Eight exchanges are involved, and toll-free calling would be available between any exchanges with a common boundary, it has been reported.

Connecticut Bill Would Simplify PUC Selection

- **Proposal would direct that commissioners be appointed by governor and confirmed by one branch of legislature.**

A CONNECTICUT legislative proposal would put the appointment of the three state public utilities commissioners on the same basis as other commissioners. The proposal would direct that public utilities commissioners be nominated by the governor and confirmed by one branch of the legislature.

The PUC commissioners presently must be confirmed by both the House and Senate. All other state commissioners in Connecticut are nominated by the governor and confirmed by either legislative branch.

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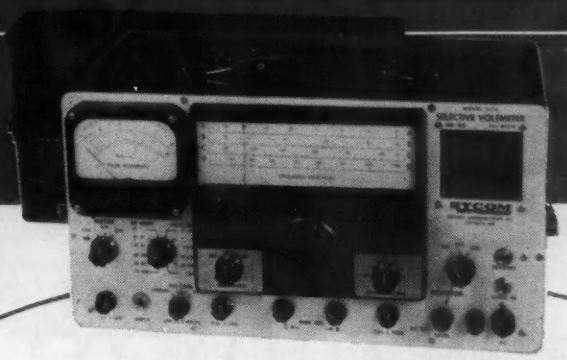

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Stockholders O.K. Merger Of Sylvania With Gen. Tel.

A NEW corporate name, General Telephone & Electronics Corp., was approved February 11 when stockholders of General Telephone Corp. voted approval of the merger of Sylvania Electric Products Inc., into their company under the new name, at a special stockholders meeting held in the Statler Hilton Hotel. At the same time, Sylvania stockholders voted approval of the merger at a meeting held in the Sheraton Plaza Hotel in Boston.

Donald C. Power, president of General Telephone, will be chairman of the board and chief executive officer of the new corporation. Don G. Mitchell, chairman of the board of Sylvania, will become president of the new company. Sylvania will continue to operate as a separate corporate entity.

Each share of outstanding Sylvania common stock at the time of the merger will be converted into one share of common stock in the new corporation. Sylvania's non-convertible Preferred Stock outstanding will be converted into two shares of voting convertible Preferred Stock of the surviving corporation.

DON G. MITCHELL (left), board chairman of Sylvania, and DONALD C. POWER, pres., General Tel. Corp.

The merger will result in increased diversification of invesment, substantially increased research and development facilities which may enable the General Telephone System to provide improved telephone service to the public and to serve better the national defense effort. Sylvania will be in an improved position to finance future development, to diversify further due to the research efforts of the combined companies, and to benefit from General's experience and background in foreign manufacturing.

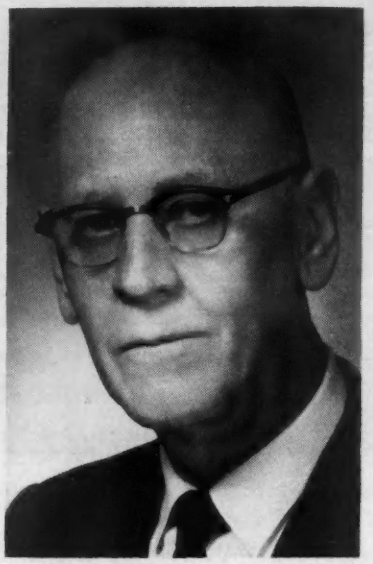
General Telephone is the largest Independent telephone company in this country, and the second largest communication system. It has telephone operating companies in 30 states, most of them in growing areas with continued prospects for sizable increases in subscribers. It also has several manufacturing units, producing equipment for the telephone industry as well as for industrial, communication and transportation fields. A research division is likewise maintained, and several manufacturing units in Europe and Canada, as well as operating companies in Canada, the Philippines, and the Dominican Republic.

Sylvania is a leading manufacturing company in the field of lighting,

television-radio, electronics, photography, and chemistry-metallurgy. It has 45 plants and 20 laboratories in 39 communities in 13 states.

A major participant in a wide variety of research and development projects for the Armed Forces, involving extremely advanced concepts, Sylvania is engaged in multi-million-dollar defense projects involving research, development and production activities in the fields of electronic countermeasures, counter-countermeasures, weapons and missile systems, data processing, communications, radar, navigation and control systems.

ROGER K. GHORMLEY



HARLAN W. CANE

Henson Joins United; L T & T Advances Ghormley

ORGANIZATION changes effective February 16 in The Lincoln (Neb.) Telephone & Telegraph Co. have been announced by President Thomas C. Woods, Jr.

Paul H. Henson, chief engineer, has resigned to become vice president of United Utilities, Inc., of Kansas City, Mo. He is succeeded by Roger K. Ghormley, formerly systems planning engineer. B. A. Isaman, formerly outside plant engineer, becomes supervisor of planning, reporting to the vice president. Harlan W. Cane, cost engineer, becomes cost control supervisor on the staff of the secretary-treasurer.

C. A. Scupin, president of United Utilities, Inc., reported Henson will serve with and report to Ralph F. Lucier, vice president in charge of operations. Scupin indicated that Mr. Henson's initial responsibilities would include the development of long-range plans for future operations of United System properties.

Henson, who has been identified with Independent telephone operations for 17 years. Prior to his appointment as chief engineer in 1955, Henson served in various Plant, Traffic, Engineering and administrative positions with the Lincoln Company.

Holding Bachelor and Master of Science degrees in Electrical Engineering from the University of Nebraska, Henson has been active in numerous professional, business and civic pursuits. Presently, he is serving as Chairman of the Engineering Committee of the United States Independent Telephone Association and is a member of its Military Liaison and Engineering Education Committees. The first annual Engineering Management Conference at Michigan State University was formulated and staged while Henson was serving as Chairman of the Engineering Education Committee.

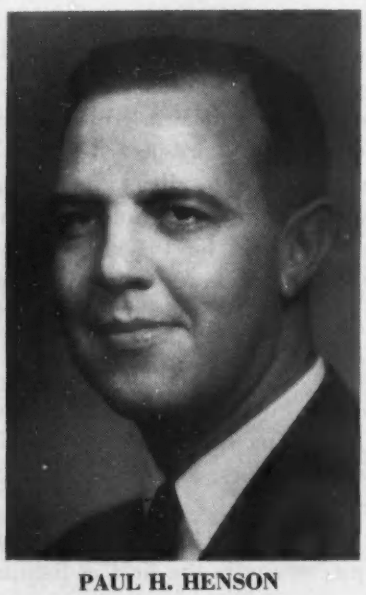
Ghormley joined LT&T in 1946 as equipment engineer and became general equipment engineer in 1955 and systems planning engineer in 1958. He graduated from Kansas State College in 1941 with a BSc degree in electrical engineering and received a master of science degree in electrical engineering in 1957 from the University of Nebraska. From 1941 to 1946 he was an engineer with the Automatic Electric Co., Chicago.

He is a registered professional engineer and a member of the Lincoln Engineering Club and of Sigma Tau and Eta Kappa Nu.

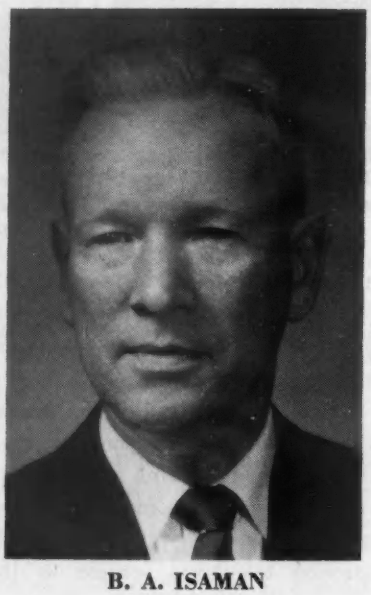
Isaman was employed with the company in 1935 at Hastings as a groundman. Later he was a testman there before moving to Humboldt as manager in 1946. In 1948 he became an engineer at Lincoln and became outside plant engineer in 1955.

He is a graduate of Hastings College where he holds an AB degree in mathematics and a BSc degree in physics. He attended Carnegie Institute of Technology for two years and then was a teacher and coach at Curtis Agricultural School.

Cane entered the telephone busi-



PAUL H. HENSON



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ness at Grand Island with the Nebraska Telephone Co. as chief clerk to the district foreman. He joined LT&T in 1923 as a clerk in the engineering department and became cost engineer in 1929.

Co-op Association Hits Eisenhower's Loan Policies

- **National Telephone Cooperative Association hears sharp criticism of Eisenhower Administration policies in Farm Telephone Program.**

A DRUMFIRE of criticism of the Eisenhower administration's policies relating to rural telephone cooperatives came Feb. 5-6, at the fifth annual meeting of the National Telephone Cooperative Association, held in Washington in conjunction with the annual sessions of the National Rural Electric Cooperative Association.

The only voice on the formal program speaking in defense of the administration's policies was that of Rural Electrification Administrator David A. Hamil.

Strongest assaults came from NRECA General Manager Clyde T. Ellis, who declared that the administration has "practically destroyed" the rural telephone program from a cooperatives' point of view, and Rep. George S. McGovern (D., S. Dak.), who cited statistical data which he said demonstrates that co-ops provide better rural telephone service than Independent telephone companies.

Rep. McGovern urged that, to strengthen the co-ops, they be permitted to serve towns of up to 3000 persons, if the local citizens wish, instead of the present 1500 limitation. Another suggestion was that telephone co-ops be taken out of REA and put in another agency, probably in the Department of Agriculture, concerned only with co-ops. He took the position that co-ops are providing better service because they frequently start with a new or almost completely new system, while Independents, he declared, may be attempting to "patch up" an older system.

Another suggestion raised during the program was that co-ops should go to Congress and seek substantial rural telephone loan authority for co-ops alone, without regard to the overall size of the farm telephone loan program.

NTCA Executive Manager Morton Langstaff noted progress made by the association so far, but he pointed out that in 1953-54, there were 180 telephone co-ops, and only 29 new ones have been added since that time.

Administrator Hamil declared that the co-ops can "count on us" to help provide service to the widest practicable number of rural users. He noted that in December REA made a loan to a cooperative in South Dakota where there is less than one subscriber per mile. "It took some special arrangements and pretty close figuring, but we made a feasible loan out of it," he pointed out.

He added that "Because of the growth of our population and the movement of people from cities to rural areas, telephone systems are going to get bigger. And there are

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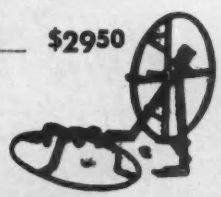

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WIRE, Insulated Drop and Bronze or Copperweld — *Acorn Insulated Wire Co., Inc., 36 Freeman St., Pawtucket, R. I.*

(Concluded from page 84)

from both cooperative and commercial borrowers . . . Against this background we need to consider the source of funds and the interest rate which telephone borrowers should expect to pay over the long run . . . I think the day will come when the public will ask you to pay the going rate for money."

Benjamin Feinberg Dies

BENJAMIN F. FEINBERG, former chairman of the New York Public Service Commission, died February 6 at the Royal Victoria Hospital, Montreal, Canada.

Mr. Feinberg, who was 70 last November, had retired as chairman of the New York Public Service Commission on December 17, 1958. However, he had been seriously ill since the Phoenix Convention of the National Association of Railroad & Utilities Commissioners (NARUC).

Mr. Feinberg was born at Malone, N. Y. on November 1, 1888. His first job was that of grocery clerk and later he became a teacher and principal of a small school in Clinton County. He was graduated from the Albany Law School in 1911 and after graduation he opened law offices in Plattsburg.

In 1932 he was elected to the State Senate where he became Majority Leader under the Dewey Administration. The advancement of public education was his first order of business. He was the author of many laws to improve school facilities and teacher standards. He was the author of one of the most celebrated anti-communist laws in the State which was passed in 1949 and prohibited Communists from teaching in the New York public schools.

On March 31, 1949 Governor Dewey appointed Senator Feinberg as chairman of the New York Public Service Commission where he served with distinction until his retirement. He had been a member of the NARUC Executive Committee since December 28, 1950 and chairman of the NARUC Committee on Progress in the Regulation of Public Utilities from 1950 to 1956. He also served on the Committee on Legislation and the Association Finance Committee.

Mr. Feinberg served as second vice president of NARUC in 1954; first vice president in 1955 and president in 1956.

CWA Urges End of Learner Rates

THE COMMUNICATIONS Workers of America would like to see learner rates for telephone operators in the Independent industry abolished completely, but failing in this, the union feels proposed increases in the rates should be higher than those now under consideration, CWA President Joseph A. Beirne said last month in a letter addressed to Clarence T. Lundquist, Administrator of the Wage and Hour and Public Contracts Division, US Dept. of Labor.

Beirne's reply was in answer to an invitation from Lundquist asking interested parties to file comments regarding a proposed increase in the learner rate.

The CWA President urged the government agency "to discontinue telephone learner rates," but said that if they are continued the increase should be at least at the same 12.5% level which, the union spokesman said, has been the average increase for telephone operators generally since learner rates were last adjusted in March, 1956.

Lundquist has announced plans to raise the minimum learner rates to 85 and 95 cents, instead of the current 80 and 90-cent minimums, for Independent company exchanges of fewer than 3,000 stations. For exchanges of more than 3,000 stations, it is proposed to increase the present 85-cent rate for the first 240 hours of the learning period to 90 cents, and to eliminate the second 240-hour learning period now having a 95-cent rate.

Beirne stated that if the 12.5% standard were applied, the result would be an increase in the present 80-cent rate to 90 cents, and the 85-cent rate to 96 cents for the first 240 hours, and "would, of course, result in a figure above the current minimum hourly wage for those now subject to the 90- and 95-cent minimums."

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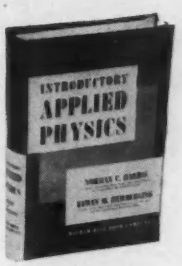

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729 pages, 6 x 9, illustrated, $6.75

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By JOHN G. REYNOLDS

"Tax Paradise"

HOW WOULD you like to live in a country where, instead of mailing the government a check for your taxes, the government would mail *you* a check each year?

Well, this odd condition actually exists in the Canadian province of Alberta. Not so long ago checks for $17.50 each were mailed at the rate of 20,000 a week to citizens in good standing.

It's all due to the fact that the government owns mineral rights to some of the most productive oil lands in Canada. Royalties for last year are estimated at something like $30 million. But it will do you no good to buy a ticket for Calgary with the expectation of lapping up some of this fine gravy. To get in on the distribution you must be a Canadian and have lived in Alberta 10 years.

"Enough Said"

FROM our Ohio correspondent we learn that in the court of Judge Wm. K. Thomas, over in Cleveland, a damage suit was in trial. In the course of testimony a witness, asked for an interpretation of the term "*specialist*," came up with a definition which we have a feeling may stand unchallenged for quite some time: "*A specialist*," he said, "*is one step above a man who gets paid overtime.*"

Anybody Lose A Cable?

THAT'S WHAT phone folks in Kermit, Tex., wondered recently when they unearthed (literally) a 100 pair cable in the downtown area.

According to Southwestern Bell's "*Telephone News*," it all began when workmen wrecking an old service station discovered to their horror that they'd sliced through a telephone cable. Repair crews rushed to the scene and turned pale to see the 100 pair cable slashed to bits. They feared the north side of town had been lost and called the district office for help.

But no one complained of losing service. No phones were out. Where did the cable go? There were no records showing such a cable even existed, so the only thing to do was to dig it up and follow it to the end. When the cable came to a dead end in a nearby alley, the mystery deepened: a cut cable that went nowhere and wasn't connected to anything.

To solve the case investigators checked back to the days when Kermit was little more than a West Texas watering place. Seems that about 20 years ago the mystery cable needed to be moved. In those days cable wasn't very expensive, so this particular one was simply severed and a new cable was put in elsewhere.

The 100 pairs of wires served every phone in town in 1938, but cutting them didn't bother a single one of Kermit's 3,200 phones today.

"Tasty Job"

DURING the past months Western Electric Installation crews have worked everywhere, from central offices to distilleries and ice cream factories, and the W. E. "*Observer*" Philadelphia installers R. D. Quinn, G. M. Albright, A. Refice and J. J. Borger are still talking about the 701-A PBX assignment at the Foremost Dairy Company's ice cream plant.

It's not the job itself they are talking about but rather the ice cream they consumed while working the job. Not only could the men eat all the ice cream they wanted during the day but at night they were usually given half-gallon packages to take home. No reports have been received from the Atlanta-West installers who finished a PBX installation job at a Frankfort, Ky. distillery.

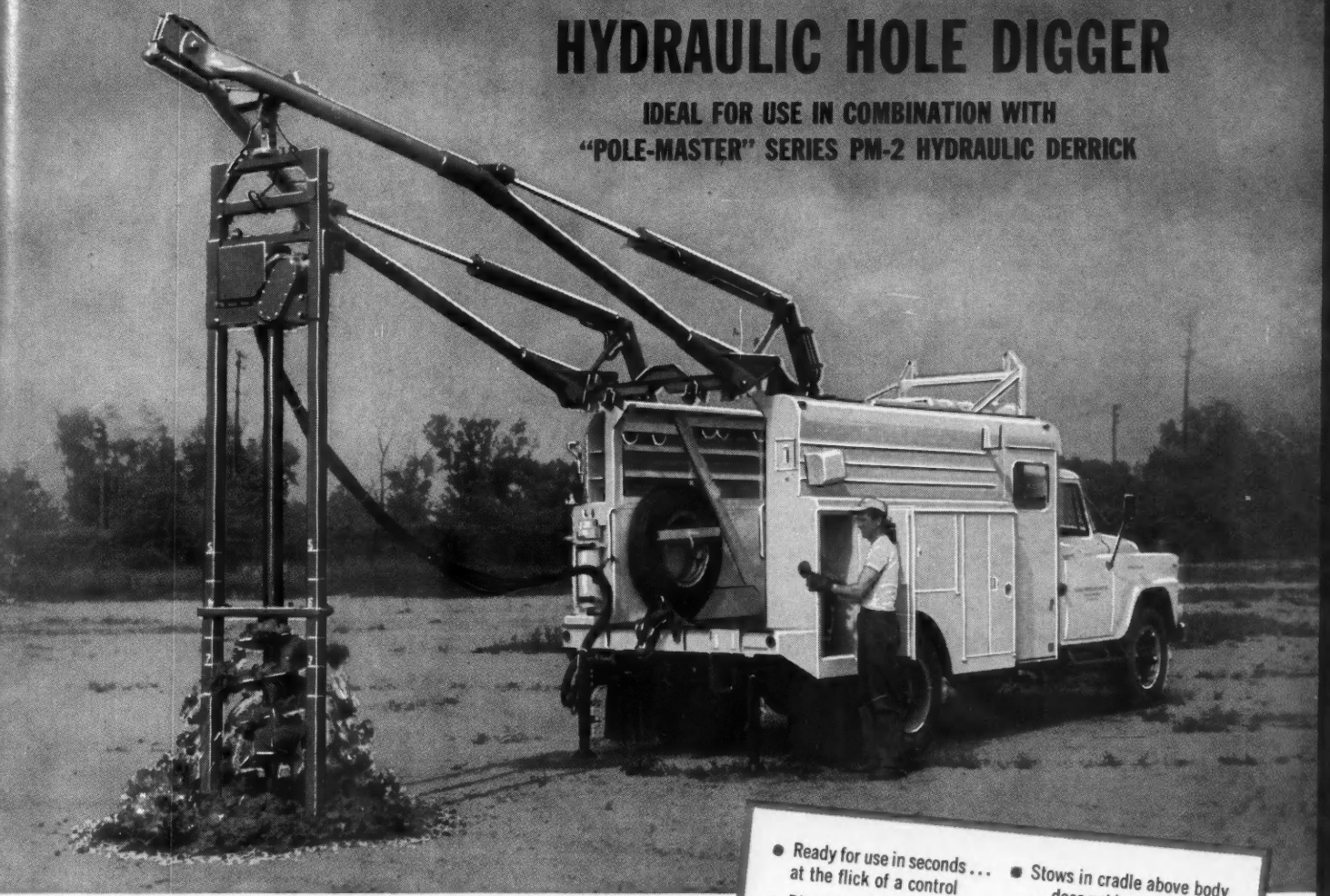
"I made arrangements with the telephone company to supply ash trays for their booths."

POWERS *American*

"Earth-Master"

HYDRAULIC HOLE DIGGER

IDEAL FOR USE IN COMBINATION WITH "POLE-MASTER" SERIES PM-2 HYDRAULIC DERRICK



Earth-Master digs holes hydraulically . . . up to 9' 4" in depth. It will dig at various angles in most types of soil. The hydraulically-powered auger, traveling up and down on a twin-column support frame, is guided at all times — digs holes that are always straight, always clean.

The auger is raised and lowered by a reversible hydraulic motor; rotated in either direction by a separate hydraulic motor. Power is derived from a hydraulic pump driven by the truck engine.

There's plenty of "down pressure" for digging in hard soil . . . supplied by the drive motor and the downward thrust which can be applied to the support frame with the hydraulic derrick.

Digger controls are located beside derrick controls in right rear body compartment . . . giving operator full view of all digger and derrick movement. An automatic, self-resetting relief valve protects the digger and hydraulic system against overload.

Earth-Master is ideal for use with the Powers-American Pole-Master Series PM-2 Hydraulic Derrick. It can be installed on derricks now in use, or factory-mounted in conjunction with a Pole-Master Derrick on a Powers-American Line Body that fits your job needs. Standard augers up to 20" in diameter can be furnished. Digger can be supplied with special Pengo Heads for digging where soil condition retards auger.

Price information and descriptive literature will be sent upon request.

- Ready for use in seconds . . . at the flick of a control
- Digs holes that are always straight . . . always clean
- "Down pressure" to spare . . . for digging frozen soil or "hard pan"
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Support frame can be turned to various angles . . . extended to fit operating conditions.

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Nicopress Splice Separators...

Ideal combination for full-strength, short-proof splices in parallel and twisted-pair wires... Nicopress Sleeves and Nicopress Splice Separators.

Nicopress Splice Separators save time, save tape, eliminate need for staggering splices, provide neater splices, eliminate shorts. Linemen readily make full-strength equal-tension splices in both parallel and twisted-pair conductors with Nicopress Sleeves and Tools, then merely snap the high-dielectric Nicopress Separator between the two splices. Tape is easy to apply over the insulated splices.

Nicopress Splice Separators are available in two sizes... 3456-B for both parallel and twisted-pair drop wire, and 3457-CD for rural distribution wire.

The National Telephone Supply Company

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